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AN INTRODUCTION TO THE STUDY OF CONCHOLOGY:

INCLUDING

OBSERVATIONS ON THE LINNÆAN GENERA,

AND ON THE ARRANGEMENT OF M. LAMARCK;

A GLOSSARY,

AND

A TABLE OF ENGLISH NAMES.

ILLUSTRATED WITH COLOURED PLATES.

BY SAMUEL BROOKES, F. L. S.

Concharumque genus parili ratione videmus
Pingere telluris gremium, qua mollibus undis
Littoris incurvi bibulam pavit æquor arenam.
LUCR. II. 374.

LONDON:
PRINTED FOR JOHN AND ARTHUR ARCH, 61, CORNHILL,
By Richard and Arthur Taylor, Shoe Lane.

1815.

LIBR

PREFACE.

THE present Work has been undertaken with a view of affording assistance to those who wish to become acquainted with Conchology, although they may not possess much previous knowledge of Natural History in general.

Many persons who spend a part of their time at the sea coast every year, and collect a few shells, attracted frequently in the first instance by the beauty of the objects, or mere curiosity, afterwards become desirous of some information respecting them, which is not readily procured. For such persons an introductory book is much wanted. In the year 1776 Da Costa published his Elements of Conchology, which is not so much an introduction to the science in general, as an attempt to introduce a new system of his own in some respects different from that of Linnæus, though founded principally on the same characters (see Transactions of the Linnæan Society, vol. 7. p. 200).

In the year 1802, Elements of Natural History, in 2 vols. 8vo, was published, without any author's name; but the part allotted to Conchology is too short to afford much of the information that is desired: perhaps the list that is given of the books which treat particularly of this branch of Natural History, and the explanation of the terms used in Testaceology, will be found to be the most useful parts to beginners.

As the present Work is intended chiefly for English readers, Latin words have been avoided as much as possible; and a Glossary of those Latin terms that frequently occur in works on this subject is added (though many of the terms are more fully explained in the work itself), as they are so much more readily found when arranged alphabetically.

That eminent naturalist M. Lamarck having given to the public a new system, or at least a new modelling of the Linnæan, it became full as necessary to take notice of it, as of the Linnæan system itself. In the *Systême des Animaux sans Vertèbres*, the number of genera comprised in the class Mollusca is 158, of which 20 are naked, and the remaining 138 are covered with shells: but there are several other genera which M. Lamarck has formed or adopted, and which are mentioned by Mr. Parkinson, in his third volume of the Organic Remains of a Former World, as being published in some other works; either in the *Journal d'Histoire Naturelle*, or *Mémoires de la Société d'Histoire Naturelle de Paris*, or the *Annales du Muséum d'Histoire Naturelle*, or the *Suite des Mémoires sur les Fossiles des Environs du Paris*, &c. But not having an opportunity of referring to those works, the descriptions of those genera, together with four or five formed by Mr. Parkinson, are taken from his "Organic Remains of a Former World." In order to elucidate the descriptions of the genera both of Linnæus and of Lamarck more perfectly than can be done by verbal description, it has been judged necessary to add some plates. The figures are generally of those shells to which Lamarck refers as examples. It is hoped that those parts on which the generic characters depend are distinctly shown. In some cases where the shells were not easily procured, or were very common, or the genus so small that perhaps only one species is known, the figures are omitted; but in this case a reference is given to a plate in some work of credit. Those which are introduced as examples of the principal genera of the recent shells are intended to make the Work more complete; but if a figure of a shell of every genus had been given, it would have added much to the expense; and in the genera in which there are but few shells known, and those chiefly fossil and very rare, as it could only be a copy of a figure already published, it was thought that it would be better to refer to other works. For instance, the genus *Nautilus* of Linnæus is divided now into twenty-two: only five figures are given: for examples of the rest, which consist of either fossil or minute species, a reference is given to Parkinson's Organic Remains, excepting two, for which M. Bourguet is referred to: while in the genus *Venus* of Linnæus, which is divided into five by Lamarck, the figure of a shell in each is given.

Those who wish to learn more of the animal inhabitants will do well to consult M. Adanson's *Histoire Naturelle du Sénégal,* and Mr. Montagu's *Testacea Britannica.* M. Favanne also has figured several of the animals in the *Zoomorphose,* from which work and M. Adanson's the plates of animals are principally copied.

The figures of the shells, which are drawn and engraved chiefly from specimens in my own collection, are given as examples of the genera used by Lamarck; at the same time they serve to show the principal varieties that are arranged together under the Linnæan genera, by Linnæus or his successors. A few figures are added, to show the different form of the mouth of some shells which are placed together in the same genus; as *Helix Gualteriana* (the mouth of which is much like that of *Trochus solaris*); and *Helix sinuata*, which has teeth; also *Turbo bidens, Juniperi*, &c.

SAMUEL BROOKES.

Penhein,
May 10, 1815.

AN

INTRODUCTION

TO

THE STUDY OF CONCHOLOGY.

CHAPTER I.

PRELIMINARY OBSERVATIONS.

ARISTOTLE appears to be the first writer of eminence on shells that we are acquainted with*: he formed them into three divisions, Univalves, Bivalves, and Turbinated Shells: many of the terms which he applied to his subdivisions still remain in use, as *Lepas, Solen, Pinna, Buccina, Nerita,* &c. But the number of shells known at that time was very small. About the year 1681 Philip Buonanni published his work, containing above 500 figures of shells†; and about the year 1685 Dr. Martin Lister published his great work entitled *Historia sive Synopsis Methodica Conchyliorum*‡, which contains about 1100 figures of shells. In the year 1742 Gualtierius published his *Index Testarum Conchyliorum quæ adservantur in Museo Nicolai Gualtieri, Philosophi et Medici Collegiati Florentini*§, in which he gives 110 plates, containing figures of between 1100 and 1200 shells, mostly represented in two different positions. In the same year M. d'Argenville published an excellent work in France on this subject[*], which was republished in 1780, with considerable additions and improvements, by Messrs. Favanne; there are upwards of 2000 shells figured in this edition, in a manner much superior to that of any which had been published before. In 1757 M. Adanson published his *Histoire Naturelle du Sénégal*[†], in which he has figured about 185 species, and accurately described not only the shells, but also most of the animals contained in them; these are arranged according to a system of his own invention, taken principally from the structure of the animals. Under most of his species he has placed many varieties that most authors have considered as distinct species; he has been very particular and minute in his descriptions of the animals, as well as their shells, and has divided them into 30 genera, in four divisions, as follow:

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* Linn. Trans. vol. 7. p. 121. † Ibid. p. 136. ‡ Ibid. p. 138. § Ibid. p. 163.

UNIVALVES.	*OPERCULES.*	*BIVALVES.*	*MULTIVALVES.*
1. *Cymbium.*	1. *Strombus.*	1. *Ostreum.*	1. *Pholas.*
2. *Bulimus.*	2. *Purpura.*	2. *Jataronus.*	2. *Teredo.*
3. *Coretus.*	3. *Buccinum.*	3. *Perna.*	
4. *Pedipes.*	4. *Cerithium.*	4. *Chama.*	
5. *Cochlea.*	5. *Vermetus.*	5. *Tellina.*	
6. *Haliotis.*	6. *Trochus.*	6. *Pectunculus.*	
7. *Lepas.*	7. *Natica.*	7. *Solen.*	
8. *Yetus.*	8. *Turbo.*		
9. *Terebra.*	9. *Nerita.*		
10. *Porcellana.*			
11. *Cyprea.*			
12. *Peribolus.*			

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[*] Linn. Trans. vol. 7. p. 165.

[†] Ibid. p. 172.

In the year 1735 Linnæus published his first edition of the *Systema Naturæ*[*], in which he divides the shells into 8 genera only; viz. *Cochlea, Nautilus, Cyprea, Haliotis, Patella, Dentalium, Concha*, and *Lepas*, which were augmented in his tenth edition, in the year 1758, to 32. In 1767 he published the twelfth and last edition, which contains 35 genera and 807 species.

Professor Gmelin published a thirteenth edition of the *Systema Naturæ* in 1788, in which he has increased the number of species to 2334[†]; but it abounds with errors, several species being described twice over under different names; the references also are frequently erroneous. This edition has been translated into English by Dr. Turton.

Linnæus may justly be considered as the first who succeeded in arranging shells in any thing like a complete manner; but when we consider the small number known in his time, what he has done must be considered rather as laying the foundation of the science than as having brought it to perfection. If we examine the different editions of the *Systema Naturæ*, and also the *Museum Ludovicæ Ulricæ*, we find there are many alterations and improvements introduced by him, as he became acquainted with more species; and no doubt, if he had lived at the present time when the number known is so greatly increased, he would have made still more improvements.

The propriety of increasing the number of genera has appeared to several authors. Scopoli, in the *Introductio ad Historiam Naturalem,* published in 1777, proposes to add ten to the Linnæan genera: seven of his own, one of Klein's, and two from Adanson; viz. *Natica* and *Bulimus* of Adanson; *Cassis* of Klein; and *Mutela, Volsella, Pteria, Sphærium, Codakia, Chion,* and *Dosinia.* He also proposes to remove

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[*] Linn. Trans. vol. 7. p. 175. [†] Ibid. p. 181.

Helix haliotoidea and *perspicua* of Linnæus to	*Haliotis.*
—— *Lampas* of Muller to	Do.
—— *Lusitanica* to	*Natica.*
—— *putris, stagnalis, tentaculata,* &c. to	*Bulimus.*
Bulla Physis, Ficus, and *Rapa* to	*Murex.*
—— *virginea*	*Buccinum.*
—— *achatina*	*Helix.*
Buccinum flammeum, Dolium, Areola, Testiculus, nitidulum, Arcularia, rufum, cornutum, &c. to	*Cassis.*
Strombus Lucifer to	*Voluta.*
Strombus Oniscus to	*Conus.*
Bulla Ovum, Volva, birostris, Spelta, gibbosa, verrucosa, and *Cyprea* to	*Cyprea.*
Mytilus Modiolus to	*Volsella.*
—— *Hirundo* to	*Pteria.*
—— *Crista galli, Pinna rudis, Donax Trunculus, Irus,* and *Tellina lævigata* to	*Mya.*
Tellina cornea to	*Sphærium.*
Donax denticulata to	*Chion.*
Venus tigerina to	*Codakia.*
—— *concentrina* to	*Dosinia.*

About the year 1787, in the *Nova Testaceorum Genera*[*], Retzius proposes to add three genera to the Linnæan ones, which is stated to be according to the intentions of Linnæus, as communicated to him by Acharius[†]: 1st, *Perna*, which includes *Mya Perna* and some species of *Mytilus*; 2dly, *Unio*, consisting of *Mya Pictorum* and *margaritifera*; and 3dly, *Melina*, of *Ostrea semi-aurita, Perna Isogonum*, and *Ephippium*. He also proposes to divide the genus *Anomia* into four, viz. *Anomia, Crania, Terebratula*, and *Placenta*. Most of these genera have since been adopted by M. Lamarck.

Considering the number of shells that have been already collected from all parts of the world, and which have not yet found their proper places in the system, from their not perfectly agreeing with any of the genera already established, the necessity of improving the Linnæan system, by increasing the number of genera and rendering them more definite, becomes every day more apparent. Something of this sort has been lately attempted in France by M. Lamarck (who enjoys the advantage of free access to the National Museum of Natural History at Paris) in his *Système des Animaux sans Vertèbres*, and in his other writings.

M. Lamarck's arrangement has been followed in this country by Mr. Parkinson, in his description of fossil shells, in the third volume of Organic Remains of a Former World, in which he has added a few genera of his own to those of M. Lamarck, and has also arranged them in a different order. But it will no doubt be thought by many that both Mr. Parkinson and M. Lamarck have divided them too much, making the genera more numerous than there is a necessity for at present; though several of their genera will scarcely be objected to by any.

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[*] Linn. Trans. vol. 7. p. 204. [†] Ibid.

M. Lamarck combines with the Linnæan order *TESTACEA* several genera of the order *MOLLUSCA*, with which he constitutes his First class of Animals without Vertebræ; this he calls

	Les MOLLUSQUES,	Mollusca.
The 2d,	*Les CRUSTACÉES,* -	Crustacea.
The 3d,	*Les ARACHNIDES,*	Spiders.
The 4th,	*Les INSECTES,* - -	Insects.
The 5th,	*Les VERS,* - - -	Worms.
The 6th,	*Les RADIAIRES,* -	Star-fish.
And the 7th,	*Les POLYPES,* - -	Polypi.

The class *MOLLUSCA* he divides into two orders, the one with heads, and the other without heads; each of these he divides into two sections, the one naked or without shells, and the other covered or nearly enclosed with shells, as follow :

MOLLUSCA WITH HEADS.

NAKED.

Those which swim at liberty.

	Lamarck's Genera.	Linnæan Genera,	Species.
1.	*Sepia.*	*Sepia*	*officinalis.*
2.	*Loligo.*	——	*Loligo.*
3.	*Octopus.*	——	*Octopus.*
4.	*Lernœa.*	*Lernœa.*	
5.	*Pterotrachea.*	*Pterotrachea.*	
6.	*Clio.*	*Clio.*	

Those which creep on the belly.

7.	*Laplisia.*	*Laplisia.*	
8.	*Dolabella.*		
9.	*Bullœa.*	*Bulla*	*aperta.*
10.	*Tethis.*	*Tethys.*	
11.	*Limax.*	*Limax.*	
12.	*Sigaretus.*	*Helix*	*haliotoidea.*
13.	*Onchidium.*	*Onchidium.*	
14.	*Tritonia.*	*Tritonia.*	
15.	*Doris.*	*Doris.*	
16.	*Phyllidea.*		
17.	*Chiton.*	*Chiton.*	

COVERED WITH SHELL.

One-celled, not spiral, but covering the back of the animal.

18.	*Patella.*	*Patella*	*testudinaria.*
19.	*Fissurella.*	——	*Grœca.*
20.	*Emarginula.*	——	*Fissura.*
21.	*Concholepas.*		
22.	*Crepidula.*	——	*porcellana.*
23.	*Calyptrœa.*	——	*equestris.*

One-celled, spiral, inclosing the animal, with a hollow at the base of the aperture.

24.	*Conus.*	*Conus.*	
25.	*Cyprœa.*	*Cyprœa.*	
26.	*Ovula.*	*Bulla*	*Ovum.*
27.	*Terebellum.*	——	*Terebellum.*
28.	*Oliva.*	*Voluta*	*porphyria.*

Mollusca with Heads (*continued*).

Lamarck's Genera.	Linnæan Genera,	Species.
29. *Ancilla.*	*Voluta*	*Oliva.*
30. *Voluta.*	———	*musica.*
31. *Mitra.*	———	*episcopalis.*
32. *Columbella.*	———	*mercatoria.*
33. *Marginella.*	———	*glabella.*
34. *Cancellaria.*	———	*cancellata.*
35. *Nassa.*	*Buccinum*	*Arcularia.*
36. *Purpura.*	———	*Persicum.*
37. *Buccinum.*	———	*undatum.*
38. *Eburna.*	———	*glabratum.*
39. *Terebra.*	———	*maculatum.*
40. *Dolium.*	———	*Dolium.*
41. *Harpa.*	———	*Harpa.*
42. *Cassis.*	———	*cornutum.*
43. *Strombus.*	*Strombus*	*pugilis.*
44. *Pterocera.*	———	*Lambis.*
45. *Rostellaria.*	———	*fusus.*
46. *Murex.*	*Murex*	*Haustellum.*
47. *Fusus.*	———	*Colus.*
48. *Pyrula.*	*Bulla*	*Ficus.*
49. *Fasciolaria.*	*Murex*	*Tulipa.*
50. *Turbinellus.*	*Voluta*	*Pyrum.*
51. *Pleurotoma.*	*Murex*	*Babylonius.*
52. *Clavatula.*		
53. *Cerithium.*	*Murex*	*Aluco.*

One-celled, spiral, inclosing the animal, without any hollow at the base of the aperture.

54. *Trochus.*	*Trochus*	*niloticus.*
55. *Solarium.*	———	*perspectivus.*
56. *Turbo.*	*Turbo*	*marmoratus.*
57. *Monodonta.*	*Trochus*	*Labio.*
58. *Cyclostoma.*	*Turbo*	*Delphinus.*
59. *Scalaria.*	———	*Scalaria.*
60. *Pupa.*	———	*Uva.*
61. *Turritella.*	———	*Terebra.*
62. *Janthina.*	*Helix*	*Janthina.*

Mollusca with Heads (*continued*).

Lamarck's Genera.	Linnæan Genera,	Species.
63. *Bulla.*	*Bulla*	*Ampulla.*
64. *Bulimus.*	*Helix*	*oblonga.*
65. *Achatina.*	*Bulla*	*achatina.*
66. *Lymnæa.*	*Helix*	*stagnalis.*
67. *Melania.*	———	*amarula.*
68. *Pyramidella.*	*Trochus*	*dolabratus.*
69. *Auricula.*	*Voluta*	*Auris Midæ.*
70. *Volvaria.*	*Bulla*	*cylindrica.*
71. *Ampullaria.*	*Helix*	*ampullacea.*
72. *Planorbis.*	———	*Cornu Arietis.*
73. *Helix.*	———	*pomatia.*
74. *Helicina.*		
75. *Nerita.*	*Nerita*	*exuvia.*
76. *Natica.*	———	*caurena.*
77. *Testacella.*		
78. *Stomatia.*	*Haliotis*	*imperforata.*
79. *Haliotis.*	———	*tuberculata.*
80. *Vermicularia.*	*Serpula*	*lumbricalis.*
81. *Siliquaria.*	———	*Anguina.*
82. *Penicillus.*	———	*Penis.*
83. *Carinaria.*	*Argonauta*	*vitrea.*
84. *Argonauta.*	———	*Argo.*

Many cells, inclosing or covering the animals.

85. *Nautilus.*	*Nautilus*	*Pompilius.*
86. *Orbulites.*		
87. *Ammonites.*	*Nautilus*	*Cornu Ammonis.*
88. *Planulites.*		
89. *Nummulites.*		
90. *Spirula.*	*Nautilus*	*spirula.*
91. *Turrilites.*		
92. *Bacculites.*		
93. *Orthocera.*	*Nautilus*	*Raphanus.*
94. *Hippurites.*		
95. *Belemnites.*	*Nautilus*	*Belemnites.*

HEADLESS MOLLUSCA.

NAKED.

Lamarck's Genera.	Linnæan Genera,	Species.
96. *Ascidia.*	*Ascidia.*	
97. *Salpa.*	*Salpa.*	
98. *Mammaria.*	*Mammaria.*	

COVERED WITH SHELL.

Two valves equal, with or without accessory ones.

99. *Pinna.*	*Pinna*	*rudis.*
100. *Mytilus.*	*Mytilus*	*edulis.*
101. *Modiola.*	———	*Modiolus.*
102. *Anodonta.*	———	*anatinus.*
103. *Unio.*	*Mya*	*Pictorum.*
104. *Nucula.*	*Arca*	*Nucleus.*
105. *Pectunculus.*	——	*Pectunculus.*
106. *Arca.*	——	*Noe.*
107. *Cucullæa.*	——	*cucullata.*
108. *Trigonia.*		
109. *Tridacna.*	*Chama*	*Gigas.*
110. *Hippopus.*	———	*Hippopus.*
111. *Cardita.*	———	*calyculata.*
112. *Isocardia.*	———	*Cor.*
113. *Cardium.*	*Cardium*	*costatum.*
114. *Crassatella.*		
115. *Paphia.*	*Venus*	*divaricata.*
116. *Lutraria.*	*Mactra*	*lutraria.*
117. *Mactra.*	———	*Stultorum.*
118. *Petricola.*	*Donax*	*Irus.*
119. *Donax.*	———	*rugosus.*
120. *Meretrix.*	*Venus*	*Meretrix.*
121. *Venus.*	———	*verrucosa.*
122. *Venericardia.*	———	*imbricata.*
123. *Cyclas.*	*Tellina*	*cornea.*
124. *Lucina.*	———	**divaricata.*
125. *Tellina.*	———	*radiata.*

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* See Parkinson's Organic Remains, vol. 3. p. 191.

Headless Mollusca (*continued*).

Lamarck's Genera.	Linnæan Genera,	Species.
126. *Capsa.*	*Venus*	*deflorata.*
127. *Sanguinolaria.*	*Solen*	*sanguinolentus.*
128. *Solen.*	——	*Vagina.*
129. *Glycemeris.*	*Mya*	*Siliqua.*
130. *Mya.*	——	*truncata.*
131. *Pholas.*	*Pholas*	*costata.*

Bivalves inclosed in a tube. Valves unequal.

132. *Teredo.*	*Teredo*	*navalis.*
133. *Fistulana.*	——	*Clava.*

Two unequal valves, with or without a hinge.

134. *Acardo.*	*Patella*	*Umbella.*
135. *Radiolites.*		
136. *Chama.*	*Chama*	*Lazarus.*
137. *Spondylus.*	*Spondylus*	*Gæderopus.*
138. *Plicatula.*	——	*plicatus.*
139. *Ostrea.*	*Ostrea*	*edulis.*
140. *Vulsella.*	*Mya*	*Vulsella.*
141. *Malleus.*	*Ostrea*	*Malleus.*
142. *Avicula.*	*Mytilus*	*Hirundo.*
143. *Perna.*	*Ostrea*	*Ephippium.*
144. *Placuna.*	*Anomia*	*Placenta.*
145. *Pecten.*	*Ostrea*	*maxima.*
146. *Lima.*	——	*Lima.*
147. *Pedum.*	——	*spondyloides.*
148. *Pandora.*	*Tellina*	*inequivalvis.*
149. *Corbula.*		
150. *Anomia.*	*Anomia*	*Ephippium.*
151. *Crania.*	——	*craniolaris.*
152. *Terebratula.*	——	*Terebratula.*
153. *Calceola.*	——	*Sandalium.*
154. *Hyalæa.*	——	*tridentata.*
155. *Orbicula.*	*Patella*	*anomala.*
156. *Lingula.*	——	*Unguis.*

More than two valves, unequal.

157. *Anatifa.*	*Lepas*	*anatifera.*
158. *Balanus.*	——	*Tintinnabulum.*

CHAPTER II.

LINNÆAN ARRANGEMENT OF SHELLS.—ANIMALS WHICH INHABIT THEM.

THE Animal Kingdom is divided by Linnæus into six classes:

The 1st, *MAMMALIA*, are viviparous. The 2d, *AVES*, are oviparous.	**These have a heart with 2 auricles and 2 ventricles, warm red blood.**
The 3d, *AMPHIBIA*, with lungs. The 4th, *PISCES*, with external gills.	**These have a heart with 1 auricle and 1 ventricle, cold red blood.**
The 5th, *INSECTA*, with antennæ. The 6th, *VERMES*, with tentacula.	**These have a heart with 1 auricle and no ventricle, cold white sanies or blood.**

The sixth class, *VERMES*, or Worms, contains five orders:

The 1st order is *INTESTINA*, or Worms, usually so called. The greatest number of these inhabit the bodies of other animals.

The 2d, *MOLLUSCA*, are of a soft substance, not covered with a shell, and generally furnished with tentacula or feelers (which are wanting in the order Intestina). These are mostly inhabitants of the sea; their forms are exceedingly various, and many of them very extraordinary.

The 3d, *TESTACEA*, are Mollusca covered with a shell. These are very numerous; some inhabit the sea; others fresh water; and others again the land.

The 4th, *Zoophyta,* or Animal Plants, consisting of corals, sponges, &c. are mostly marine productions; many of them resemble vegetables so much that they were formerly classed in the Vegetable Kingdom, and called Stony Plants: it has, however, been ascertained that they are the work and habitation of numberless small animals of the Polypus kind.

The 5th, *Infusoria,* which are mostly microscopic objects, are found in various infusions, also in water both pure and impure.

Linnæus divides the order *TESTACEA,* or Shells, into *Multivalves, Bivalves,* and *Univalves.* The first is composed of those that consist of more than two pieces; the second, of those of two pieces only, united by a hinge; and the third, of those of but one piece. The whole of these are divided into 35 genera. The genus named *Sabella* does not properly belong to the Testacea; many of the species are only the cases of the larvæ of sub-aquatic flies; and the rest are all, more or less, composed of extraneous matter agglutinated together; such as sand, broken shells, &c. of a finer or coarser texture, according to the nature of the animal inhabitant*.

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* See Montagu's *Testacea Britannica,* p. 534; and Linn. Trans. vol. 8. p. 249.

Linnæus's genera are as follow:

Multivalves.

1. *Chiton.*
2. *Lepas.*
3. *Pholas.*

Bivalves.

4. *Mya.*
5. *Solen.*
6. *Tellina.*
7. *Cardium.*
8. *Mactra.*
9. *Donax.*
10. *Venus.*
11. *Spondylus.*
12. *Chama.*
13. *Arca.*
14. *Ostrea.*
15. *Anomia.*
16. *Mytilus.*
17. *Pinna.*

Univalves with a regular spire.

18. *Argonauta.*
19. *Nautilus.*
20. *Conus.*
21. *Cypræa.*
22. *Bulla.*
23. *Voluta.*
24. *Buccinum.*
25. *Strombus.*
26. *Murex.*
27. *Trochus.*
28. *Turbo.*
29. *Helix.*
30. *Nerita.*
31. *Haliotis.*

Univalves without a regular spire.

32. *Patella.*
33. *Dentalium.*
34. *Serpula.*
35. *Teredo.*

To this arrangement, though far surpassing any thing which preceded it, there are still some few objections. The nearer any artificial arrangement can be brought to a natural one, the nearer it obviously approaches to perfection. With this view of the subject, it must be observed that the three genera of Multivalves have no connection with each other, as far as regards the animal, and very little in regard to the shell. The animal of the *Chiton* approaches nearer to the animal of the *Patella* than any other[*], and belongs to the natural family of the *Limax* of Linnæus. The animal of the *Lepas*, called a *Triton* by Linnæus, if not a species of *Polypus*, is nearly allied to it; and the animal of the *Pholas* is an *Ascidia*, one of the families composing the Bivalves.

OF THE ANIMALS.

The animals of the Bivalves, together with the *Pholas*, form a natural division (the Headless Mollusca of Lamarck), which may be subdivided into four families. None of these have any thing that can be properly called a head, but are furnished with either one or two tubes, by means of which they draw in their food along with the water, which is emitted again by the same tube in those that have only one, and by the other tube in those that have two.

In the animals of the first family called *Ascidia*[†], the membrane named by M. Adanson *manteau* (which is attached to each valve) is united in front, forming a kind of bag or tube, apparently open at both ends, from the upper end of which two conjoined tubes project, which are often of considerable length; and from the lower end a short obtuse foot. This family includes the genera *Pholas*, the true *Mya*, and the *Solen* of Linnæus, but not the two species of *Mya Pictorum* and *margaritifera*.

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[*] See Adanson's *Histoire Naturelle du Sénégal*, p. 42.

[†] Ibid. pl. 19. f. Tagal and Iulan, p. 256 and 262.

The second family is known by the English name of *Cockle**: these have the membrane called *manteau* or *pallium* divided into two parts, being open in front; they project two separate tubes from the upper end of the shell, which are commonly very short; from the front of the shell they protrude a fleshy muscular foot, somewhat scythe-shaped; they have two strong muscles by which they open and shut their shells, one situated near each end of the shell, the places of which may be easily perceived, as they almost always leave a distinct mark on the interior surfaces. This family comprehends the *Tellina*, *Cardium*, *Mactra*, *Donax*, *Venus*, *Arca*, and some species of *Chama*, and a few which, perhaps, are improperly placed with the *Solen*.

The third family are the *Muscles*†: these have the *manteau* or *pallium* divided or open in front, like the last, but do not project any tube beyond their shells; they protrude a foot somewhat tongue-shaped; many species fix themselves by a *byssus* or cluster of threads; these have either three or four muscles for opening and shutting their shells, two of which are generally larger than the others, but they seldom leave any mark on the interior surface of the shell. This family comprises the genera *Pinna* and *Mytilus*, excepting a few improperly placed with the *Mytili*, as *M. Frons*, *Crista galli*, &c. Here we may place the genus *Unio* of Retzius and Lamarck, *i. e.* *Mya Pictorum*, &c. of Linnæus.

The fourth family are the *Oysters*: these are the *Tethys* of

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* See Adanson, pl. 18. f. Mofat.

† Ibid. pl. 15. f. Lulat.

Linnæus; they protrude neither tube nor foot beyond the shell; the *pallium* is divided; they have only one large muscle, which in many species leaves a conspicuous mark on the interior surface of the shell, as in the common Oyster, *Ostrea edulis* of Linnæus; but in many others the mark is not discernible, as in most of the Scallops. This family includes the genus *Ostrea*, with the Scallops or *Pectines*, the *Spondylus*, a few *Chamæ*, and some of the *Anomiæ*.

The next natural division (the Mollusca with Heads of Lamarck) includes the animals inhabiting the *Argonauta* and the *Nautilus*, which are very little known, and appear to belong or are nearly allied to the *Sepia* or Cuttle-fish. It comprehends also the animals of the rest of the Univalves, including the *Chiton*, if we except *Dentalium*, *Teredo*, and *Serpula*. This division consists of two families; one having a windpipe or breathing tube projecting more or less beyond the edge of the shell nearly on the back of the animal, through a hollow groove or cavity, which may be seen at the end of the shell furthest from the spire (*pl.* 5. *f.* 59. *a*); and the other without any such tube, and consequently without any hollow or notch at the edge of the shell (*pl.* 9. *f.* 118 and 119. *a*). The animals of this division are furnished with a head, and horns or feelers, generally two eyes, and with teeth which are very numerous in some species; they are all called *Limax* by Linnæus.

The genera *Conus*, *Cypræa*, *Buccinum*, *Strombus*, *Murex*, with part of the *Bullæ*, and most of the *Volutæ*, constitute the family of *Limaces* with a breathing tube. These, with scarcely any exception, inhabit water, and have only two horns; the eyes are placed at the root of the horns, or at some part of their side, but never quite at the end or tip (*pl.* 5. *f.* 59); several of these animals are furnished with a cylindrical trunk or *proboscis*, at the end of which is the mouth furnished with small teeth of a hook-like form, with which the animal pierces other shells, and then sucks the flesh of the inhabitants for its food (*pl.* 10. *f.* 1).

The family of *Limaces* without a breathing tube, of which the Garden Snail is a familiar example, comprehends the remaining species of the genus *Bulla* and *Voluta,* and all those of *Trochus, Turbo, Helix, Nerita, Haliotis, Patella,* and *Chiton.* The water species have generally two horns, except the *Chiton* and some *Bullæ.* The eyes in some are placed on the head or at the side of the horns; but many of the animals have, besides the horns, a short kind of column or pillar at the outside of each horn (*pl.* 9. *f.* 119. *a*), with the eyes placed at the tip of them, as in most of the *Neritæ.* All the land species belong to this family; these have four horns, with the eyes at the tips of the longest; but none have the trunk or *proboscis* noticed in the other family.

OF THE SHELLS.

Of the shells we may observe that the two valves or pieces of which the Bivalves are composed are in general more or less convex; in a great number both valves are equally so; in many, one is more convex than the other; but in some few both are flat (*pl.* 4. *f.* 46. *Anomia Placenta*). The valves are generally attached to each other by a cartilage that serves for a hinge; there is seen on the outside of each valve, near the cartilage, a kind of blunt point, which is as it were the base of the shell, from whence the increase or growth takes place; this point is called the beak, in Latin *umbo* or *nates* (*pl.* 3. *f.* 37. *a*); the hinge part is called the base of the shell (*pl.* 3. *f.* 26. *a*), and the opposite part the upper margin (*pl.* 3. *f.* 26. *b*); that side of the beaks where the cartilage is found is called the *anterior slope* (*pl.* 3. *f.* 26. c), and the other side of the beaks the *posterior slope* (*pl.* 3. *f.* 26. *d*).

The Univalves are said to consist of only one piece, though many species have a smaller piece also, with which the animal, after retiring within his shell, closes the aperture; this is called the *operculum*; but as it is never attached to the shell, but only to the foot of the animal, this part is seldom met with in collections. Most univalve shells are a kind of tube rolled up more or less in a spiral form; that end where the turns can be perceived is called the spire (*pl.* 5. *f.* 60. *a*); each turn or circle is called a whorl or volution; the outward volution is called the last whorl, being the one last formed, and is oftentimes larger than all the preceding ones taken together; the centre or point where the first whorl begins is termed the *apex* (*pl.* 5. *f.* 60. *e*). Linnæus calls that part of the aperture of the shell which is furthest from the spire the *base* (*pl.* 5. *f.* 60. *b*), and the spiral end the *fore part.* The aperture of the shell is called the *mouth*, the edges of which are called *lips*; the outer side is termed the *right* or *outer lip* (*pl.* 5. *f.* 60. *c*), and the body of the shell, being in fact the outside of the preceding whorl, is called the *inner* or *pillar lip* (*pl.* 5. *f.* 60. *d*); that part of the aperture which is furthest from the spire, and called by Linnæus the base, in several genera ends in a canal or hollow groove (*pl.* 7. *f.* 88. *a*). M. Adanson calls this the *superior canal*; sometimes there is a small hollow or notch at the end of the mouth nearest to the spire (*pl.* 7. *f.* 91. *a*); this M. Adanson calls the *inferior canal.*

In many species, each whorl is joined to the preceding in such a manner that at the end opposite the spire they leave a vacancy or hole in the centre, which sometimes extends to the very point of the *apex*; this aperture is called the *umbilicus* (*pl.* 8. *f.* 98. *a.* and *f.* 105. *a*). Those shells that have this *umbilicus* are said to be *perforated*, but in many species the last whorl joins to or covers the former whorls in such a manner as to leave no vacancy or hole; these shells are called *imperforate*; there are a few species in which the young shells have an *umbilicus*, but as they get older they lose it, as *Nerita Mamilla.*

Most shells have a membrane or skin covering the outside; in some it is thick and rough, as though it were hairy, as in some species of the *Murex*, *Arca*, &c., particularly in *Arca Noæ* and *barbata*, and *Mytilus Modiolus* (*pl.* 4. *f.* 48. *a*); in most it is very thin, and some are without any, as are all the *Cypræœ*, *Voluta Oliva*, and some species of *Donax*: it is said by Adanson to contribute to the growth and preservation of the shells, as the *periosteum* does to the bones, and is called the *perioste* by Adanson; but how it contributes to their growth does not appear clear, as all shells seem to increase by successive layers of stony matter on the inside of the shell, which is secreted from some part of the animal, each layer projecting a little at the edges beyond the preceding ones: the edges of these layers may generally be perceived with the naked eye; they oftentimes form the lines which in the Bivalves are commonly denominated transverse *striæ* (*pl.* 2. *f.* 20).

The Bivalves, which are divided by Linnæus into fourteen genera, are distinguished by some peculiarity of the hinge, principally by the number, form, or situation of the teeth, which are small protuberances found near to the beak or cartilage.

The Univalves are divided by Linnæus into eighteen genera, and are distinguished by something peculiar in the formation of the mouth or aperture of the shell. The generic characters are given by Linnæus as follow: but if they were strictly adhered to, it is very evident that several new genera must be introduced to receive many shells which could not properly be included in any of these.

MULTIVALVES.

Chiton.	Shell of many pieces longitudinally on the back.
Lepas.	Shell of many pieces unequal and sitting.
Pholas.	Shell of two pieces with several smaller behind.

BIVALVES.

Mya. Hinge of the shell with a thick hollow tooth.

Solen. Hinge of the shell with the side teeth remote.

Tellina. Hinge of the shell with lateral teeth of one side wanting.

Cardium. Hinge of the shell with remote lateral teeth penetrating.

Mactra. Hinge of the shell with the middle tooth folded.

Donax. Hinge of the shell with the remote lateral tooth wanting.

Venus. Hinge of the shell with approximate diverging teeth.

Spondylus. Hinge of the shell with two teeth separated by a hollow.

Chama. Hinge of the shell with two oblique obtuse teeth.

Arca. Hinge of the shell with numerous penetrating teeth.

Ostrea. Hinge of the shell with an egg-shaped pit, no teeth.

Anomia. Hinge of the shell with a linear marginal pit, no teeth.

Mytilus. Hinge of the shell with a distinct awl-shaped pit, no teeth.

Pinna. Hinge of the shell with one of the margins united, no teeth.

UNIVALVES with a regular spire.

Argonauta. Shell with one cell; animal a *Sepia.*

Nautilus. Shell with many cells communicating by a small hole.

Conus. Shell with the aperture effuse linear, and without teeth.

Cypræa. Shell with the aperture effuse linear; teeth on both sides.

Bulla. Shell with the aperture somewhat contracted, oblique.

Voluta. Shell with the aperture effuse, with the pillar folded.

Buccinum. Shell with the aperture with a channel to the right.

Strombus. Shell with the aperture having a channel to the left.

Murex. Shell with the aperture having a straight channel.

Trochus. Shell with the aperture compressed, somewhat square.

Turbo. Shell with the aperture compressed, round.

Helix. Shell with the aperture compressed, moon-shaped.

Nerita. Shell with the aperture compressed, half round.

Haliotis. Shell with the aperture wide, bored.

UNIVALVES without a regular spire.

Patella. Shell an open cone, resting.

Dentalium. Shell free, awl-shaped, open at each end.

Serpula. Shell fixed, tubular.

Teredo. Shell intruded in wood.

CHAPTER III.

OF THE TERMS USED IN DESCRIBING SHELLS.

It is to be observed in explaining the terms made use of in describing shells, that the same word has sometimes a very different meaning from what it is intended to convey at others; but if the connection in which it is used is attended to, there will seldom occur much difficulty in knowing how to understand it. For instance, the term *ovata* occurs in the twelfth edition of *Systema Naturæ,* and in the eighth volume of the Transactions of the Linnæan Society, in describing the form of *Mya truncata* and *arenaria,* and also of *Bulla fontinalis* and *Hypnorum,* although the first are of a very different shape from the last. Also *Cypræa Onyx, C. Ziczac,* &c. are said to be *umbilicata,* as well as *Nerita Caurena, glaucina,* &c., though the hollow which is called the *umbilicus* is so exceedingly different in form and structure in the first from what it is in the last.

OF BIVALVE SHELLS.

First, of the Substance, which is either—

Crassus, thick, as *Venus verrucosa.*
Tenuis, thin, as *Tellina depressa* and *Fabula.*
Membranacea, thin like a skin, as *Solen anatinus.*
Fragilis, brittle, as *Solen Legumen.*
Pellucidus, transparent, as *Tellina lactea* and *lacustris.*
Opacus, opake, as *Cardium edule.*
Margaritaceus, pearly, as *Mytilus margaritiferus.*

Secondly, of the Form.

Bivalve shells are said to be—

Æquivalvis, when both the valves or pieces are equally convex, as in *Cardium edule*.

Inæquivalvis, when one of the valves is flatter than the other, as in *Ostrea edulis*.

Convexus, when the two valves are considerably convex or swelled out: this is opposed to *compressus*.

Gibbus, when the valves are considerably but not regularly swelled out, being as it were bunched out more in one place than in another.

Compressus, when the valves are but little convex or swelled out. Some few are quite flat, as *Anomia Placenta*; but most shells are more or less convex.

OF CONVEX FORMS.

Globosus is when the two valves together form nearly a sphere or globe, as *Tellina cornea*.

Ovatus is when the two valves form nearly an egg-shape, as *Cardium serratum*.

Ovalis is nearly egg-shaped, but having the two ends equal or almost equal, as *Pholas crispata*.

Oblongus is when the shell is drawn out longer in proportion to the thickness, as *Pholas candidus*.

Cylindricus is when the valves together nearly form a cylinder, as *Mytilus lithophagus*.

Linearis-rectus differs little from cylindrical; it is long and straight, the margins of the valves being parallel to each other, as *Solen Vagina* and *Siliqua*.

Linearis-subarcuatus is long and a little bent, with the margins parallel, as *Solen Ensis*.

Navicularis is boat-shaped, as *Arca Noæ*.

Semi-orbiculatus is shaped like half a globe, as *Chama orbiculata*.

Cordatus is when the valves together nearly form the shape of a heart, as *Cardium Isocardia*.

Triangulus-cordatus is between triangular and heart-shaped, as *Donax Scortum*.

Triangulus-rotundatus is between triangular and round, as *Venus castrensis*.

Sub-rhomboideus is somewhat like a rhomboid, as *Arca lactea*.

Trapezius is irregularly four-sided, as *Chama trapezia*.

(*Sub* being prefixed to any term, means *rather*, or *a little*. *Ob*, when prefixed to any term, means *about*.)

OF COMPRESSED FORMS.

Orbiculatus is round and flat, as *Anomia Placenta*.

Sub-rotundus is somewhat round and flattish, as *Mactra Listeri*.

Lentiformis is round like a lentil, slightly convex on each side, with a sharp edge, as *Venus tigerina*.

Ovatus, egg-shaped, is broader at one end than the other, as *Tellina planata*.

Ovalis, oval, differs from *ovatus* in having the two ends equal, or nearly so, as *Tellina Gari*.

Oblongus is longer in proportion to the breadth, and more like a long square with the corners rounded off, as *Tellina radiata.*

Triangulatus, triangular, as *Mactra subtruncata.*

Cordatus, heart-shaped, but compressed thin, as *Cardium Cardissa.*

Linguæformis, tongue-shaped, long, and rather tapering, as *Mya Vulsella.*

Cuneiformis, wedge-shaped, as *Donax cuneata.*

Auriculàtus is with two small appendages or wings, called by Linnæus ears, as in *Ostrea maxima*, the common Scallop (*pl.* 4. *f.* 41).

OF THE PARTS OF BIVALVE SHELLS.

First, of the Beaks.

Nates or *Umbo*, a beak, is a blunt point which may be seen on the outside of each valve near the hinge.

Incurvatus or *Inflexus* is when the beaks are curved inward, as in *Arca Glycymeris.*

Recurvatus or *Reflexus* is when the beaks are curved backward, as in *Chama Cor.*

Approximatus is when the two beaks are near together, or stand approaching to each other, as *Cardium Cardissa.*

Distans is when the two beaks stand at a distance from each other, as in *Cardium Hemicardium.*

Remotissimus is when they stand at a greater distance from each other, as in *Arca Noæ.*

Prominulus is when the beaks are but little prominent, or almost level with the general surface of the shell, as in *Mactra solida*.

Prominens is when the beaks are a little more prominent, as in *Mactra stultorum* and *Venus undata*.

Gibbus is when the beaks are swelled out, as in *Mytilus Modiolus*.

Productior is when they are more extended beyond the surface of the shell, as in *Chama gryphoides*.

Corniformis is when they are shaped like a horn, and produced beyond the general surface, as in *Chama bicornis*.

Fornicatus is when they are arched over, as in *Mytilus bilocularis*.

Acutus is when the beaks end in rather a sharp point, as *Venus Gallina*.

Acuminatus is when the beaks taper to a point like a dart or sting, as in *Mytilus edulis*.

Obtusus is when the beaks end in a blunt point, like *Donax castanea*.

Perforatus is when one of the beaks is perforated, as in *Anomia Caput serpentis*.

Secondly, of the Hinge.

Cardo, the hinge, consists of the connecting cartilage and the teeth. Linnæus takes but few of his generic characters from the cartilage, but M. Lamarck has made much more use of it; in many cases it forms a very good generic character. Many genera have an external cartilage, as for in stance *Solen, Tellina, Venus, Cardium, Mytilus,* and *Pinna.* In several it is internal, as *Mactra, Spondylus, Ostrea, Anomia,* and most of the *Myæ:* in a few species it is sunk in a groove into the thickness of the shell, so as not to be called properly either external or internal, as in *Venus Meröe* and *tigerina,* and some species of *Donax.* In the last division of the genus *Ostrea* it is divided into many parts, as *Ostrea Isognomum,* &c.

Dentes, the teeth, are eminences or projections on the internal surface or margin of the valves, near to the beaks and cartilage; they are most generally received into corresponding hollows in the opposite valve: when this is the case they are said by Linnæus to be inserted; but when there are no corresponding hollows to be perceived in the opposite valve, they are said not to be inserted.

Cardinis Dentes, or hinge teeth, are the teeth which are placed in the centre, under the beaks; those which are found at some distance, on each side, are the lateral teeth; but in the genus *Arca* there is no such distinction, the teeth being numerous and arranged in a line.

Subulatus is when they are long and sharp, or awl-shaped, as in the genus *Solen.*

Acutus is when the teeth are short and sharp, as in the genus *Arca.*

Recurvus is when the teeth are hooked or bent backward, as in *Spondylus.*

Duplex is when a tooth is as it were split into two.

Thirdly, of the Margin.

That part of the margin which is opposite the beaks (*pl.* 3. *f.* 26. *b*) is often called the upper margin, or *margo superior*; and, as the cartilage is considered by Linnæus as occupying the anterior parts of the shell, so that part of the margin which lies between the beaks and the end, on the side where the cartilage is found (*pl.* 3. *f.* 26. *c*), is called the anterior margin, and that between the beaks and the other end (*pl.* 3. *f.* 26. *d*) the posterior margin; the hollow or cleft that is occupied by the cartilage is called *rima anterior*. The margin is said to be *integerrimus* when it is smooth without any notch or wrinkle, and is opposed to *dentatus*, *serratus*, &c., as *Donax cuneata*, *Venus Chione*, &c.

Acutus is when the margin is smooth, but thin and sharp, as in *Mactra stultorum*.

Dentatus is when the margin has small wrinkles, called teeth, as in *Donax denticulatus*.

Serratus is when the margin is toothed like a saw, as in *Cardium serratum*.

Crenatus is when the margin is wrinkled or notched, with larger wrinkles than *dentatus*, as in *Arca Glycymeris*.

Plicatus is when the wrinkles are still larger, like plaits or folds, as in *Arca Pectunculus* and *senilis*.

OF UNIVALVE SHELLS.

The Univalve spiral shells are said to be *involute* or *convolute*.

Involutus is when the spire is rolled in, so that both ends are enveloped by the outer whorl, as in the genus *Cypræa.*

Convolutus is when the spire is rolled in, so that one end only is enveloped, as in the genera *Conus, Voluta,* &c.

Rotundatus is when the shell is rolled up in nearly the form of a globe, as *Bulla Naucum, Ampulla,* &c.

Sub-globosus is rather less globular, with the spire more extended, as *Nerita Vitellus.*

Ovatus is egg-shaped, as *Conus rusticus* and *Mercator, Nerita virginea,* or *Bulla fontinalis.*

Oblongus, or oblong, as *Helix Amarula.*

Ovatus-oblongus is between egg-shaped and oblong, as *Buccinum reticulatum.*

Pyriformis is when the shell is nearly pear-shaped, as in *Voluta Pyrum,* and also one division of the genus *Conus* of Linnæus.

Pyramidalis is like a pyramid, as *Trochus cinereus.*

Conicus is conical, of which there are two sorts, one with the spire flat, forming the base of the cone, as *Conus marmoreus,* and many of the genus *Conus*; the other with the aperture at the base, and the spire tapering, as *Trochus niloticus,* and many species of *Trochus.*

Cylindricus is nearly cylindrical, as *Bulla Terebellum.*

Fusiformis is spindle-shaped, and differs from cylindrical in being swelled out at the middle and tapering at each end, as *Strombus fusus.*

Turritus, towering, is when the spiral turns are numerous and drawn out to a considerable length, as *Trochus Telescopium*, and *Turbo Terebra*.

Teres is tapering, but not spirally turned, as *Dentalium Entalis*.

Tubulosus is a tube in different forms, as in the genus *Serpula*.

Rectus is straight, as *Nautilus Raphanistrum* and *Orthocera*.

Angulatus, angular, is generally applied to shells not spiral, as *Patella saccharina*.

Orbiculatus is nearly like half a globe, the shell not spiral, as *Patella equestris*.

Ovalis is a flat oval shell, as *Patella crepidula* and *fornicata*.

Auriformis is ear-shaped, as in the genus *Haliotis*.

Convexus is when the shell is but little convex, or between *sub-globosus* and *planus*, as in *Trochus Magus* and *Helix virgata*; *Helix Lapicida* is convex on both sides.

Depressus is nearly like *convexus*, but flatter, as *Trochus umbilicatus* and *Helix ericetorum*.

Planus is flat, as *Helix Vortex* and *contorta*.

OF THE PARTS OF UNIVALVE SHELLS.

The principal parts of Univalves are the spire, the aperture or mouth, the lips, and the *operculum*.

Spira, the spire, is that part of the shell where the turns or whorls are seen in a spiral form.

Apertura, the aperture or mouth, whence the animal in part comes out or retires at will.

Cauda, the tail, is found at that part of the aperture which is furthest from the spire.

Labia, the lips, are the edges of the aperture, the outer side of which is called the lip, *labrum**; it is also sometimes called the outer or right lip, *labium exterius vel dextrum;* the inner side, or that part which joins to the preceding turn or whorl, is called the inner lip, *labium interius*†; or the pillar lip, *labium columellæ*‡; or the left lip, *labium sinistrorsum.*

Operculum is that small piece which is separate from the shell, but attached to the foot of the animal, with which it closes the opening when it retires into its shell; this piece is wanting in a great many shells.

OF THE SPIRE, *SPIRA.*

Truncata is with the spire flat as if cut off, and forms the base of the conic shape of Linnæus's first division of *Conus.*

Obliterata is when the spire can hardly be perceived, as in *Bulla Ficus* and *Voluta Monilis.*

Prominens is when the spire is rather prominent, as in *Voluta Ispidula.*

Producta is when the spire is much more prominent or produced, as in *Murex despectus* and *corneus.*

Longa is when it is very long in proportion to the shell, as in *Strombus Pes pelecani.*

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* See *Voluta glabella* of Linnæus's *Systema Naturæ*, 12th edit.

† See *Nerita Mammilla*, ibid.

‡ See genus *Nerita*, ibid.

Subulata is awl-shaped or tapering, as in *Bulla Terebellum.*

Acuta is sharp-pointed, as in *Bulla rivalis.*

Acutissima is ending in a very sharp point, as in *Strombus costatus* and *Trochus papillosus.*

Obtusa is blunt pointed, and is opposed to *Acutus,* as in *Voluta Coffea* and *pallida.*

Lævigata is with the whorls of the spire smooth as if worn with water, as in *Voluta glabella* and *Olla.*

Coronata is crowned or encircled with prominences, as in *Voluta æthiopica* and several of the genus *Conus.*

Inermis is unarmed or without any prominences, and is opposed to *coronatus,* as *Conus glaucus.*

OF THE APERTURE, *APERTURA.*

Integra is when the mouth is whole or without any canal or notch on the margin, as is the case with the genera *Nerita, Helix, Turbo,* and *Trochus,* and part of the genus *Voluta,* and some *Bullæ.*

Coarctata is when the aperture is contracted or compressed, as in some *Bullæ,* but without a hollow or notch.

Effusa is when the aperture has a notch or spout as if formed to pour out a fluid, as the aperture of *Cypræa,* which is effuse at both ends, but the aperture of the Cones is effuse at one end only.

Dilatata is when the aperture is very much spread out, as in *Helix haliotoidea.*

Circinnata is with the aperture round, as in *Turbo fontinalis* and *cristatus.*

Semi-orbiculata is half a round, as in the genus *Nerita.*

Oblonga is oblong, somewhat of a long oval, as *Voluta tornatilis* and *Murex costatus.*

Ovalis is nearly a short oval, as *Buccinum Lapillus* and *Murex Erinaceus.*

Ovata is approaching to an egg-shape, as *Helix vivipara* and *palustris.*

Pyriformis is somewhat pear-shaped, as in *Murex fuscatus.*

Cordata is heart-shaped, as in *Nautilus Pompilius.*

Semi-cordata is shaped like half a heart, as in *Trochus solaris* and *Helix complanata.*

Quadrata is approaching to square or four-sided, as in many of the *Trochi,* and in *Turbo perversus* and *striatus.*

Sub-triangularis is nearly triangular, as in *Turbo vertigo* and *sex-dentatus.*

Semi-lunaris is crescent-shaped, as in *Helix rufescens,* &c.

Utrinque-acuta is when both ends of the aperture terminate in a point, as in *Helix Planorbis* and *Gualteriana.*

Longitudinalis is lengthwise of the shell, as in the genus *Conus,* and in *Cypræa.*

Linearis is long and narrow, as in *Bulla obtusa.*

Angustissima is very narrow, as in *Bulla cylindracea.*

Marginata is with a margin or border round the mouth, as in *Helix Lapicida* and *H. Oculus capri.*

Reflexa is with the margin bent back, as in *Turbo corneus* and *reflexus.*

Lævis is with the edge of the aperture smooth, as in *Murex Pusio* and *Melongena.*

Striata is when the inside of the aperture is marked with lines, as in *Murex senticosus.*

Edentula is when the aperture is without any teeth, as in *Buccinum Perdix* and *Nerita Canrena.*

Dentata is when the aperture has teeth on one side or the other, as in *Buccinum Pomum* and *Murex tritonis.*

Utrinque-dentata is when the aperture has teeth on both sides, as in *Voluta Coffea* and in the genus *Cypræa.*

Uni-dentata is when the aperture has one tooth only, as in *Trochus Labio* and *Turbo Uva.*

Bi-dentata, Tri-dentata, &c., the aperture with two teeth, with three teeth, &c.

OF THE TAIL, *CAUDA.*

Ecaudata is when the shell has a notch or hollow on the margin at the part furthest from the spire, but not extended into a groove or canal, as in *Murex Hippocastanum* and *neritoideus.*

Brevis is when the canal is very short, as in *Murex tritonis* and *Pusio,*

Truncata is when it appears as if a part had been cut off, as in *Murex ramosus* and *Scorpio.*

Prominens is when it extends but a little way, as in *Buccinum echinophorum.*

Subulata is when it is long and slender, as in *Murex Haustellum, Tribulus,* and *cornutus.*

Recta is when it stands in a straight line, as in *Murex babylonius.*

Flexuosa is when it is bent on one side, as in *Murex Lotorium* and *Pyrum.*

Recurva or *Reflexa* is when the tail is bent back, as in *Buccinum cornutum, rufum,* and *tuberosum.*

Adscendens is when the tail rises upwards supposing the shell to be laid with the mouth downwards, as in *Murex Pileare, reticularis,* and *Vertagus.*

Erecta is when the tail is turned quite upright supposing the shell laid with the mouth downwards, as in *Murex Anus.*

OF THE LIPS, *LABIA.*

Explanatum is when the left lip is spread out on the last whorl, as in *Buccinum gibbosulum* and *neriteum.*

Striatum is when there are lines marked on the inside of the outer lip, as in *Buccinum hæmastoma* and *undosum.*

Edentula is when the lips are without teeth on the edge, as in *Nerita fluviatilis* and *lacustris.*

Dentatum is when there are sharp points or projections on the edge of the outer lip, as in *Strombus Fusus.*

Muricatum is when there are sharp points on the edge of the lip, but not so large as *Dentatum,* as in *Buccinum Vibex* and *Erinaceus.*

Crenulatum is when the edge is wrinkled, as in *Buccinum Persicum* and *patulum.*

Tetradactylum is when the edge of the outer lip is extended into four claws, as in *Strombus Pes pelecani.*

Hexadactylum is when the outer lip is extended into six claws, as in *Strombus Chiragra.*

Heptadactylum is when it has seven claws, as in *Strombus Lambis* and *Scorpius.*

Decadactylum is when the lip is furnished with ten claws, as in *Strombus Millepeda.*

Trilobum is when the outer lip terminates in three obtuse divisions or lobes, as in *Strombus lentiginosus.*

Prominens is when the outer lip is but a little extended, as in *Strombus Pugilis.*

Rotundatum is when the outer lip is more extended and roundish, as in *Strombus Epidromis* and *Gigas.*

Attenuatum is when the edge of the outer lip is very thin, as in *Strombus Urceus* and *dentatus.*

Fissum is when the edge of the outer lip is notched at the end nearest the spire, as in *Murex babylonius.*

Perpendiculare is when a small part of the shell is seen withinside suspended from the summit of some *Patellæ,* as in *Patella equestris.*

Laterale is when a kind of partition is seen attached to one side within a *Patella,* as in *Patella chinensis* and *neritoidea.*

Concavum is when a *Patella* has a concave partition within, as in *Patella fornicata.*

Posticum is when the partition is at the back part of the inside, as in *Patella Porcellana.*

OF THE *OPERCULUM.*

Linnæus scarcely mentions any of the *opercula:* Rumphius and Gualtieri have given figures of several of them; most of the *Turbines* have thick testaceous *opercula* exactly closing the aperture, and so have most of the *Neritæ*; but these are not in general quite so thick as those of the *Turbines,* but they also take the shape of the mouth of their respective shells; very few of the *Helices* have any, except *Helix vivipara* and *tentaculata*; those are thin and horny, and exactly fit the aperture. Several *Buccina, Murices,* and *Coni,* &c. have also *opercula,* but these extend in size to only a part of the aperture.

OF THE SURFACE OF SHELLS, *SUPERFICIES.*

Lævis is when the surface is smooth and even, as in *Mactra stultorum* and *Voluta porphyria.*

Lævigata is as if worn or washed smooth, as in *Tellina lævigata* and *Buccinum decussatum.*

Glabra is with the outside bright, as *Venus Meretrix* and *Conus Capitaneus.*

Glaberrima is very bright, as *Venus castrensis* and *Buccinum glabratum.*

Nitida is shining, as *Tellina radiata* and *Turbo petholatus.*

Lineatis is marked with coloured lines, as in *Conus Princeps.*

Striata is marked with small elevated lines, as in *Nerita Peloronta*, *Venus islandica*, and *Voluta mercatoria.*

Radiata is rayed or marked with coloured streaks diverging from the beak, as in *Venus Gallina.*

Fasciis is with coloured bands, as in *Conus Mercator.*

Radiis, with raised ridges diverging from the beak, as in *Ostrea maxima* and *Ziczac.*

Cingulo is with a band raised above the general surface, as in *Strombus Oniscus* and *Buccinum Dolium* and *rufum.*

Sulcis, with ridges, as in *Cardium Isocardia* and *Fragum.*

Sulcata is grooved, as in *Venus Dione* and *Cypræa Pediculus.*

Costata is ribbed, as in *Murex senticosus* and *Cardium costatum.*

Rugosa is wrinkled, as in *Mytilus rugosus* and *Turbo Chrysostomus.*

Varicibus is with swelled ribs or sutures across the whorls, as *Buccinum Harpa* and *costatum.*

Plicata is as if the shell was folded or with plaits, as *Ostrea diluviana*, *Buccinum Arcularia*, and *Voluta cancellata.*

Cancellata is with either channels or ribs across the whorls, as *Turbo scalaris*, *Clathrus*, and *Uva.*

Reticulata is as if covered with net work, as in *Tellina reticulata* and *Murex reticularis.*

Imbricata is tiled, as in *Ostrea Lima* and *Cardium Isocardia.*

Lamellis is covered with thin leaf-like plates, as in *Chama Lazarus* and *Ostrea diluviana.*

Squamulis is with little scales, as *Tellina Lingua felis* and *Buccinum decussatum.*

Tuberculata is when covered with little raised knobs or tubercles, as *Buccinum papillosum, Cypræa Nucleus,* and *Trochus maculatus.*

Nodosa is knotty, as in *Ostrea nodosa, Cardium tuberculatum, Murex Trunculus* and *Lignarius.*

Spinis is when it is armed with long prickles or spines, as in *Murex Brandaris* and *Trunculus,* and *Turbo Delphinus.*

Muricata is covered with many sharp points, as *Chama Gryphoides* and *Buccinum patulum.*

Scabra is rough, as *Tellina Lingua felis* and *Buccinum Persicum.*

CHAPTER IV.

OF THE *CHITON*. GENUS I.

CHITON.

"Animal a *Doris*. Shells many, longitudinally disposed, covering the back."—Linn.

The shells composing this genus are easily distinguished from all others. They are of an oval form (*f.* 1. *pl.* 1), somewhat resembling the *Oniscus* or common Wood Louse: the shell does not inclose the animal, but only covers the back of it: it is composed generally of eight pieces called valves, surrounded by a narrow belt or margin, which is sometimes covered with scales (*pl.* 1. *f.* 1. *c c*). Some few shells have been found with only six or with seven valves, but they are probably accidental varieties. The animal is somewhat similar to that inhabiting the *Patella*, but is not capable like that of protruding the head beyond the margin of the shell; the head is nearly crescent-shaped, without any appearance of either eyes or horns: it appears to belong to the family of Slugs, or the *Limax* of Linnæus. They are all inhabitants of the sea, and are generally found creeping on the rocks, or attached to stones, to other shells, or to sea-weeds, and not unfrequently on Oysters on the coast of South Devon.

The valves, excepting the first and last, are often striated in two different directions that divide each valve into three compartments: one, which may be called the middle division, stretches across the shell, or lengthways of the valves (*pl.* 1. *f.* 1. *a*); the others may be called the side divisions (*pl.* 1. *f.* 1. *b b*). When these divisions are marked with lines across the valves (*pl.* 1. *f.* 1. *a*), they are said to be transversely striated; but when they are marked with lines lengthways of the valves, that is, across the shell (*pl.* 1. *f.* 1. *b*), they are said to be longitudinally striated.

Linnæus has described, in his twelfth edition of *Systema Naturæ*, only 9 species; Gmelin has added 19, and Dr. Turton none: making in all 28. Adanson considers the *Chiton* as a sort of *Patella.*

Lamarck has placed the *Chiton*, under the name of *Oscabrion*, as well as *Bulla aperta* and *Helix Haliotoidea*, among his Mollusca with Heads, Naked, and which creep on the Belly; he says it is covered with a skin furnished in the middle with a row of testaceous pieces transversely set in the thickness, and more or less appearing outwardly (*pl.* 1. *f.* 1. *Chiton squamosus*).

CHAPTER V.

OF THE *LEPAS*. GENUS II.

LEPAS.

"Animal a *Triton*. Shell with many valves; the valves unequal, fixed by the base."—Linn.

These shells are of various forms, but most of them are a sort of truncated cone; all the different species contain animals similar to each other, but very different from those which inhabit any of the other shells. These shells are fixed by the base to some other substance, either to rocks, stones, pieces of wood floating in the sea, or to other shells, &c. They are frequently found attached to the bottoms of ships in such numbers as to impede their progress in sailing.

Most of the species consist of twelve pieces or valves, six of which are called outer valves; these are nearly triangular, with the pointed end upwards (*pl.* 1. *f.* 5. *a a a*); the six intermediate ones, with the points downwards (*pl.* 1. *f.* 5. *b b*), are termed the inner valves. They have also an *operculum* or little door (*pl.* 1. *f.* 5. *c*) composed of four valves or pieces (*pl.* 1. *f.* 3), which the animals open at pleasure when they extend their *tentacula* for catching their prey.

There are a few species which are found attached to whales and tortoises, that are broader and flatter than the others; in these the shell appears very large in comparison with the aperture destined for the residence of the animals. Most of the shells in this genus are very porous; but the pores in this division are so large that we may rather call them cells, as may be seen in *pl.* 1. *f.* 6, where the underside of *Lepas Diadema* is represented.

There are also a few species of a very different form and texture; these are attached to other substances by means of a cartilaginous tube, which is sometimes of a considerable length; the shells themselves are very much compressed or flattened sideways (*pl.* 1, *f.* 2), as in *Lepas anatifera*; the number of valves vary in the different species from five to thirteen or more. These have been separated from the rest by several authors, particularly Dr. Pulteney and Mr. Montagu, who have formed of them a new genus called *Lepas*: to the remainder they give the name of *Balanus*.

Linnæus, in the twelfth edition of *Systema Naturæ*, describes only 10 species in the whole; Gmelin has added 18, and Dr. Turton 4, making together 32; but it is supposed that more than double this number are now known.

Lamarck has divided this genus into four, as follows*:

BALANUS, a conic shell, truncated above, fixed by its base, without a cartilaginous tube, and composed of six valves, articulated by the sides and by their lower edge. The aperture closed by a four-valved *operculum* (see *Lepas tintinnabulum* Linn. *pl.* 1. *f.* 3 and 5).

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* See Parkinson's Organic Remains, vol. 3. p. 239 and 240.

Anatifa, a wedge-shaped shell, composed of five or more unequal valves united at the end of a cartilaginous tube, fixed by its base. The aperture without an *operculum* (see *Lepas anatifera* Linn. *pl.* 1. *f.* 2).

Coronula, a regular sub-conic shell, divided into twelve areas, with an aperture both below and above; the upper one closed with a four-valved *operculum* (see *Lepas Diadema* Linn. *pl.* 1. *f.* 6).

Tubicinella, a tubular univalve, not spiral, narrowing towards the base, truncated at each end. The aperture round, with a four-valved *operculum* (see *Lepas tracheæformis*, *pl.* 1. *f.* 4).

When the valves are marked with lines running from the bottom to the top, they are said to be striated longitudinally (*pl.* 1. *f.* 5. *a*); but when the lines are marked the contrary way, they are said to be transversely striated (*pl.* 1. *f.* 5. *b*). The *striæ* or lines on the *operculum* are called longitudinal when running lengthways from the base to the point, or transverse when lying across (as in *pl.* 1. *f.* 3).

CHAPTER VI.

OF THE *PHOLAS*, GENUS III.

PHOLAS.

"Animal an *Ascidia.* Shell bivalve, spreading, with several less and differently shaped accessory valves at the hinge; hinge recurved, connected by a cartilage."—LINN.

THIS animal, which Linnæus calls an *Ascidia*, is scarcely any thing more than a fleshy membranaceous bag, nearly of the length of the shell, apparently open at each end; through the upper end there protrudes a cylindrical muscular tube, divided by a partition into two, toward the extremity; and at or through the lower end of the bag proceeds a short obtusely conical foot. The shell, which is somewhat cylindrical, consists of two valves, open or gaping at each end (*pl.* 1. *f.* 9), connected together by a cartilage, which serves for a hinge; at this part the edge of the shell is reflected or turned back, and in some species forms several small cells (*pl.* 1. *f.* 7. *A*), which are generally covered with a small bony plate; there are likewise one or two more small plates covering the cartilage of the hinge (*pl.* 1. *f.* 8); all these are called accessory valves, the number and form varying in the different species, but commonly from two to four.

The outer surface of the shell is rough, with sharp ridges or points something like a file, which roughness is supposed to enable it to bore the holes in which it is found; but most probably it first softens the substance by means of some fluid which it may have the power of secreting from its own body: several species are known to be phosphoric, shining with great brilliancy in the dark. They are found lodged in holes, which they perforate in the rocks, or in wood, or clay, &c. The outer orifice is small, by which they enter when young, enlarging the internal cavity as they increase in size, so as completely to imprison themselves, but always to such a depth that they can reach the mouth of their cells with their tubes when they extend them to take their prey.

Linnæus has described 6 species, Gmelin has added 6, and Dr. Turton none: making a total of 12.

Lamarck has made no alteration in this genus; he describes the *Pholas* as a transverse gaping shell, composed of two large principal valves, with several small accessory pieces placed on the cartilage or hinge (see *Pholas Dactylus* Linn. *pl.* 1. *f.* 7, 8, and 9).

Those marks or ridges on the shell that are nearly parallel to the outer margin (as in *pl.* 1. *f.* 7) are said to be transverse, and those which are in lines radiating from the hinge to the margin are called longitudinal (*pl.* 1. *f.* 7).

CHAPTER VII.

OF THE *MYA*. GENUS IV.

MYA.

"Animal an *Ascidia*. Shell bivalve, open at one end; the hinge with a tooth, (in many) solid; thick, spreading, and hollowed (not inserted in the opposite valve)."—LINN.

MOST of these shells have a large perpendicular projection in one valve, called a tooth by Linnæus (*pl.* 1. *f.* 10. *a*), slightly hollowed for holding the cartilage; but it has no teeth like those of the other genera, as *Tellina, Venus,* or *Cardium*; the other valve has a hollow under the beak that receives the opposite side of the cartilage, as in *M. arenaria* and *truncata.* These shells are unable to shut close at one end: the cartilage is wholly internal in the hollows before mentioned.

The animal is nearly similar to the animal of the *Pholas*; some species are capable of extending their tubes to the length of eight or nine inches, and which are united their whole length, like the *Pholas*; the mantle is closed in front, and it protrudes a short foot from the lower end. Some species are only capable of contracting their tubes to about three inches in length, but cannot withdraw them completely within the shell.

They are generally found buried in the sand of the sea shore, at such depths that they can just reach the surface with their tubes when extended to their full length, always maintaining a communication with the water.

Linnæus has described 7 species, Gmelin has added 14, and Dr. Turton 5. Total, 26,

Mya Perna is so much like the common Muscle, that it cannot be properly placed in this genus. Linnæus says, in the *Systema Naturæ*, twelfth edition, "*Forte Mytili species*;" and it is said to have been his intention* to have formed a new genus for it by the name of *Perna*, and also another by the name of *Unio*, for the reception of *Mya Pictorum* and *margaritifera*, which have an external cartilage, and longitudinal ridges in the place of teeth (*pl.* 2. *f.* 12); the animals of these, as well as the teeth and cartilages, being so very different from the generic description, and from the other species of *Mya*, that the propriety of removing them cannot justly be doubted. Mr. Montagu has formed a new genus, part of which he has taken from the *Mya*, and part from the *Mactra*, by the name of *Ligula*, which he describes thus: "Shell bivalve, equivalve; hinge with a broad tooth in each valve, projecting inwards, furnished with a pit or cavity for the reception of the connecting cartilage; and in some species a minute erect tooth. The shells he places here are *Mya prætenuis, pubescens, distorta*; *Mactra compressa, tenuis*, and *Boysii*, &c.

The gaping or truncated end is called the posterior part

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* See Linn. Trans. vol. 7. p. 205.

(*pl.* 1. *f.* 10. *b*); when in its natural position in the sand, this is the upper end, from which the tubes project. When there are any lines or marks on the shell nearly parallel to the margin, which is opposite to the hinge and beaks, they are called transverse; but if there are any diverging like rays, from the beak to the margin, they are called longitudinal.

Lamarck has divided this genus into four, as follows:

UNIO. Shell transverse, having three muscular impressions; an irregular callous hinge; tooth prolonging itself on one side under the cartilage, and articulating with that of the opposite valve (see *Schrot. Flus. Conch. t.* 2. *f.* 3. or *Mya Pictorum, pl.* 2. *f.* 12).

GLYCEMERIS. Shell transverse, gaping at both ends; the hinge callous, without teeth; cartilage external (see *Mya Siliqua*, Chemn. vol. xi. t. 198. f. 1934).

MYA. Shell transverse, gaping at both ends; cartilage internal; the left valve furnished with one hinge tooth, compressed, rounded, perpendicular to the valve to which the cartilage is attached (see *Mya truncata, pl.* 1. *f.* 10).

VULSELLA. Shell free, longitudinal, nearly equivalved, with a flattish callous hinge, without teeth, projecting alike on each valve, with a conical rounded hollow for the cartilage, terminating in a very short bent beak (see *Mya Vulsella, pl.* 1. *f.* 11). Animal fixing itself with a byssus.

M. Menard has separated another, which is adopted by Mr. Parkinson, as well as the four of Lamarck's, viz.

PANOPÆA. Shell transverse, inequilateral, gaping unequally at the ends. Hinge with an elongated tooth, under the cartilaginal depression in both valves on the interior edge; a conical hinge tooth, rather flat and bent, and on the right valve a little pit which receives the tooth opposite, the cartilage external. Two muscular impressions in each valve towards the extremities (see *Mya Glycemeris,* Born, Mus. t. 1. f. 8).

CHAPTER VIII.

OF THE *SOLEN*. GENUS V.

SOLEN.

"**Animal an *Ascidia*. Shell bivalve, oblong, open at each side; hinge with awl-shaped teeth, bent backwards, often double, not inserted in the opposite valve; lateral margin obsolete."—Linn.**

The *Solenes* are called in English Razor Shells, several of the species being supposed to resemble a razor handle; they are open at both ends, which are called sides by Linnæus, as he calls the length of the shell the distance from the hinge side to the opposite margin, which is very short in *Solen Vagina*, &c., while the breadth is often six or eight times as much. The animal of the *Solen* (like the animals of the *Pholas* and *Mya*) has the mantle united in front, and protrudes two united tubes about three or four inches from the upper end of the shell, and a short obtuse conical foot from the lower end. They are found buried in the sand, like the *Mya*. The cartilage is external, and sometimes situated near the middle of the shell, as in *Solen Legumen*; but often at the lower end, as in *Solen Vagina*. There is in each valve, under the cartilage, a longitudinal ridge, with the point or tooth erect or perpendicular; in some species the point in one valve is divided, receiving the point of the other valve into the vacancy between. The beak or *umbo* is in general small and flat; it is always close to the cartilage, whether that be near to the centre or to one end.

There are a few shells placed here by Linnæus, and more by Gmelin and Turton, which would evidently be better removed, as *Solen sanguinolentus, bullatus, anatinus,* &c., since the teeth do not agree with the generic definition.

Linnæus has described 11 species, Gmelin has added 12, and Dr. Turton none. In all, 23.

Lamarck has divided this genus into two, as follows:

SANGUINOLARIA. Shell transverse, the upper edge arched, a little gaping at the extremities; the hinge teeth two, approximating and articulating on each valve (see *Solen sanguinolentus, pl.* 2. *f.* 14).

SOLEN. Shell transverse, the upper and lower edges nearly straight; beaks not projecting, gaping at both ends; hinge teeth single in each valve, or double in one; cartilage external (see *Solen Vagina, pl.* 2. *f.* 13).

CHAPTER IX.

OF THE *TELLINA*. GENUS VI.

TELLINA.

"Animal a *Tethys*. Shell bivalve, the fore part folded from one side to the other; hinge with three teeth, the lateral ones flat in one shell."—LINN.

THIS genus is not so well defined as many others. Linnæus says, "hinge with three teeth;" he also says the same of the *Venus*. The *Tellinæ* have generally two hinge teeth in one valve, and one in the other valve; but some species have more, and some have less. The animal is a species of Cockle, having the mantle or *pallium* open or divided in front, projecting two distinct short tubes from one end, which in most species reach but just beyond the margin of the shell, and a scythe-shaped muscular foot from the front. Linnæus calls it a *Tethys*; so also he does the Oyster, from which it differs much. The *Tellina*, like all the Cockles, has two muscular impressions on the inner surface of each valve: but the Oyster has only one.

The teeth in the different species vary so much that it is very difficult to know which shells are *Tellinæ* and which are not. Perhaps Linnæus might rely principally on the fold-like appearance towards the pointed end or fore part, which is seen in many of the species, for determining this genus; but still he has admitted many which are destitute of it, as *Tellina reti-*

culata, bimaculata, pisiformis, divaricata, cornea, &c. If the teeth are to be principally attended to, we should be led to place here *Solen bullatus, Venus deflorata,* and many others.

The centre or hinge teeth are generally small in the *Tellinæ,* compared to those in the *Venus*; some have a lateral tooth at some distance on each side of the centre teeth, as in *Tellina virgata, radiata, carnaria,* &c.; some have the lateral tooth on one side at a distance, but on the other side very near, as *Tellina punicea,* and *Remies* or *fausta,* &c.; many have no lateral teeth, as *Tellina solidula, striata, divaricata, lactea,* &c. The cartilage is external, but rather sunk in a hollow or groove. The lines or marks on the outer surface of the shell are called longitudinal when they spread like rays from the beak to the circumference, but those which are nearly parallel to the margin are transverse.

The *Tellina fluminalis, fluminea,* and *fluviatilis* are by some placed with the *Venus*; but they do not agree in their teeth with either, or indeed with any Linnæan genus, and they might with great propriety constitute a new one. They have two or three centre teeth in each valve, and a longitudinal crenated ridge on each side the beak in one valve, shutting into crenated hollows formed for their reception in the opposite valve.

Linnæus has described 29 species, Gmelin has added 62, and Dr. Turton 3. Total, 94.

Mr. Montagu has removed a few species from this genus, as *T. pisiformis, cornea, amnica,* and *lacustris,* to the genus

Cardium; but as they do not quite agree in their teeth with the other *Cardiums*, perhaps it would be better to follow Lamarck, and make a separate genus of them.

Lamarck has divided this genus into four, as follows:

Cyclas. Shell nearly orbicular, or a little transverse, without any fold on the fore part; cartilage external; hinge with two or three centre teeth, the lateral ones lengthened, compressed, and intruded (*Tellina cornea*, Pennant's Brit. Zool. 4. t. 49. f. 36. See *pl.* 2. *f.* 15).

Lucina. Shell nearly orbicular or transverse, without any fold on the fore part; the centre teeth variable; two lateral teeth remote (*Tellina divaricata* Linn. See *pl.* 2. *f.* 16).

Tellina. Shell orbicular or transverse, having an irregular fold on the fore part; one or two centre teeth, and remote lateral teeth (*Tellina radiata* Linn. See *pl.* 2. *f.* 17).

Pandora. Shell regular; valves unequal and inequilateral, with two oblong unequal and diverging teeth at the centre of the upper valve, and two oblong corresponding hollows in the other valve; cartilage internal, two muscular impressions (*Tellina inæquivalvis.* See *pl.* 2. *f.* 18).

It may be remarked here, that probably some shells that have hitherto been arranged with the *Tellinæ* will be placed in the genus *Sanguinolaria*, and also some in *Capsa*. Perhaps we may place here Lamarck's genus of *Corbula*, and also Mr. Parkinson's *Trigonellites*, which are described by them as follows:

Corbula. Shell inequivalve, subtransverse, free, and regular, with a conic tooth recurved on each valve; the cartilage internal, two muscular impressions (see Brander. *Foss. Hant.* no. 103; Chemn. vol. 10. f. 1668 and 1671).

Trigonellites. A slightly rounded trigonal thick shell, gaping on each side; the anterior margin nearly straight, the posterior gently waving. The hinge linear, without teeth; cartilage external, no appearance of muscular attachment (see Park. Organ. Rem. vol. 3. p. 184. t. 13. *f.* 10 and 11).

CHAPTER X.

OF THE *CARDIUM.* GENUS VII.

CARDIUM.

"Animal a *Tethys*. Shell bivalve, nearly equilateral and equivalved; the hinge with the middle teeth alternately in couples; the lateral teeth remote and inserted."—LINN.

THIS genus is very distinct from every other, the teeth scarcely varying in the different species. There are two centre teeth under the beak in each valve, standing in contrary positions; in one valve they stand side by side; in the other valve they are placed one before the other. They are all received into hollows in the opposite valve, as may be observed in the common Cockle. There is always a lateral tooth on each side in both valves, shutting into a hollow formed for its reception in the opposite valve. They are in general strong thick shells, very convex, and mostly with strong prominent ribs on the outer surface, extending like rays from the beak to the margin. The cartilage is short and external just under the beaks.

The animal is commonly called a Cockle; it is much like the *Tellina*; the mantle or *pallium* is open in front; it protrudes two short tubes from the upper end of the shell, and a scythe-shaped muscular foot from the front.

Linnæus has described 21 species, Gmelin has added 28, and Dr. Turton 3. Total, 52.

Mr. Montagu has placed *Tellina, Cornea, amnicum, lacustris*, and *pisiformis* in this genus.

Lamarck has made no alteration in this genus, but describes it as follows:

Cardium. Shell somewhat heart-shaped, the valves toothed or folded at the edge; hinge with four teeth, of which the two centre ones are approaching oblique in each valve, articulating crossways with the opposite ones; the lateral ones remote and intruded (*Cardium Unedo* Linn. See *pl.* 2. *f*, 19).

CHAPTER XI.

OF THE *MACTRA.* GENUS VIII.

MACTRA.

"Animal a *Tethys.* Shell bivalve, with unequal sides, and equivalved; hinge, the middle tooth folded, with a small hollow adjoining; lateral teeth remote and inserted."—LINN.

THIS genus is easily known by the hollow (*pl.* 2. *f.* 20. *a*) under the beak, between the teeth, which is found in both valves, and serves to hold the cartilage, which is thus wholly internal. There is frequently on one side of the hollow a diverging tooth like two sides of a triangle (*pl.* 2. *f.* 20. *b*) in either one or both valves. Some species, as *M. solida, striatula, stultorum,* &c., have lateral teeth, but a few are without, as *M. lutraria.*

The cartilage internal, and the hollow for it being accompanied by teeth may be considered as the essential character of this genus, by which it may clearly be distinguished from every other; it approaches most to the *Mya*; but in that the hollow for the cartilage has no teeth accompanying it, and stands erect.

The animal is closely allied to the Cockle; it has two tubes, which project but a short distance beyond the edge of the shell: it also protrudes a foot at the front, towards the lower end, like the Cockle. The lines radiating from the beak to the margin are called longitudinal; and those that are parallel to the margin are called transverse.

Linnæus describes only 8 species, Gmelin has added 19, and Dr. Turton none. Total, 27. But it is probable that some of the smaller species have inadvertently been placed among the *Tellinæ.*

Lamarck has divided this genus into two, as follows:

Lutraria. Shell transverse and inequilateral, gaping at the extremities; two oblique and diverging centre teeth accompanying a large pit for the cartilage; no lateral teeth (*Mactra lutraria.* See *pl.* 2. *f.* 20).

Mactra. Shell transverse and inequilateral, a little gaping; the hinge tooth folded like a gutter, articulating with that on the opposite valve, and accompanied with a hollow that holds the cartilage; one or two lateral teeth, compressed and inserted (*Mactra stultorum.* See *pl.* 2. *f.* 21).

Lamarck's genera of *Crassatella* and *Erycina* are nearly allied to *Mactra*, both of them having an internal cartilage; but most of the shells placed in these genera are fossil.

Crassatella. Shell inequivalve, somewhat transverse, with closed valves, with a lunule sunk deep, and having the cartilage internal; the hollow for the cartilage placed under the beaks, and above the teeth of the hinge (see Park. Organ. Rem. vol. 3. p. 180. t. 13. f. 2),

Erycina. An equivalved, inequilateral, transverse bivalve; the hinge teeth two, diverging upwards, with a small intermediate pit; the lateral teeth compressed and oblong; the cartilage inserted in the hinge pit (see Park. Organ. Rem. vol. 3. p. 181. t. 13. f. 13).

CHAPTER XII.

OF THE *DONAX*. GENUS IX.

DONAX.

> "Animal a *Tethys*. Shell bivalve, the fore part of the margin very obtuse; hinge with two teeth, and a single marginal tooth a little distant behind."—LINN.

THIS is a very indistinct genus, being in some instances difficult to distinguish from the *Venus*, and in other cases from the *Tellina*, between which it seems to form a connecting link, the *Donax scripta* agreeing in the teeth with *Venus Meröe*, as *D. Trunculus* does with some of the *Tellinæ*.

Many species are truncate at one end or wedge-shaped; but this cannot be considered the essential character, as some species are not so, and some shells of other genera are wedge-shaped also, as *Mactra striatula*, &c.

The centre teeth vary in number in the different species; some have only one in each valve, as *D. radiata*; some have one in one valve and two in the other, as *D. lævigata, Trunculus*, &c.; and others have two in one valve and three in the other, as *D. scripta*, &c. The lateral teeth also vary, some shells having none, as *D. Trunculus, lævigata*, &c.; some have them on one side, as *D. scripta*; and some have them on both sides, as *D. denticulata*, &c.

The cartilage is external; in some species it is prominent, as *Trunculus*, *cuneata*, &c.; but sunk in a groove in others, as *D. scripta*, &c.

The animal is a Cockle, and, like the *Tellina* and *Venus*, protrudes two short tubes from the longer or pointed end, and a short scythe-shaped foot from the front near the lower or truncated end.

The *D. Irus* is an exception, the animal being an *Ascidia* (see Mont. *Brit. Test.* p. 573), with the teeth of the shell like a *Venus*.

Linnæus describes 10 species, Gmelin has added 9, and Dr. Turton none. Total, 19.

The lines or grooves from the beaks to the margin are called longitudinal *striæ*; but when marked with strokes in that direction, but of a colour different from the rest of the surface, they are said to be radiate (*pl.* 2. *f.* 23).

They are said to be transversely striate when they have lines or grooves parallel to the margin; but when they are marked with lines of another colour in this direction, they are said to be banded.

Lamarck divides this genus into two, as follows:

PETRICOLA. Shell transverse and inequilateral, gaping a little at both ends, having two muscular impressions, with two hinge teeth on one valve and a bifid one on the other; cartilage external (*Donax Irus.* See *pl.* 2. *f.* 22).

DONAX. Shell transverse, inequilateral; cartilage external; the hinge teeth two on the left valve; lateral teeth one or two on each valve, rather distant (*Donax cuneata.* See *pl.* 2. *f.* 23).

CHAPTER XIII.

OF THE *VENUS*. GENUS X.

VENUS.

> "Animal a *Tethys*. Shell bivalve, the lips incumbent at the front margin; the hinge with three teeth, all approximate, the side ones diverging from the point."—LINN.

THESE are mostly thick strong shells, and are easily known by their large strong central teeth, having no lateral ones; most of them have three teeth in each valve under the beak, as *Venus mercenaria*, &c.; sometimes one of the teeth stands in a contrary direction or parallel to the margin, as in *Venus castrensis*, *maculata*, *Erycina*, &c. Many species have a heart-shaped depression under the beaks, as *Venus Erycina*, *Paphia*, &c.; though some are without, as *Venus castrensis*, *decussata*, &c. Some few have four teeth in one if not both valves, as *Venus Chione*, *pectinata*, *divaricata*, &c. *Venus edentula*, which has no teeth, and *Venus deflorata*, which has but two teeth in each valve, would at least agree as well, if not better, with the *Tellina* than with the *Venus*. *Venus Meröe* agrees in the teeth, and also in the shape of the shell, with *Donax scripta*. It must be acknowledged that some species placed in this genus approach so near to some of the *Tellinæ*, if we pay regard to the teeth, while some others are so much like some species of *Donax*, that there is considerable difficulty in knowing where to draw the line of distinction between them.

The animal is a Cockle, and differs but little from the animal of the *Tellina*, if we except perhaps *Venus lapicida* and *lithophaga*.

Linnæus describes 38 species, Gmelin has added 107, and Dr. Turton 9. Total, 154.

Lamarck has placed *Venus lithophaga*, &c. in his genus *Petricola*, and *Venus islandica* and some others in *Cyclas*, and *Venus pensylvanica*, &c. in *Lucina*; and has divided the rest into five genera, as follows:

Paphia. Shell sub-transverse, inequilateral, the valves shutting close; the cartilage internal; the hollow for its insertion is under the beaks, and between or beside the teeth of the hinge (*Venus divaricata.* See *pl.* 2. *f.* 24).

Venus. Shell nearly orbicular or transverse, with three hinge teeth approaching, of which the side ones are more or less diverging (*Venus verrucosa* Linn. See *pl.* 2. *f.* 25).

Meretrix. Shell with two or three approximate hinge teeth converging at the base, with a distant one under the heart-shaped depression in one valve, and a hollow for its reception in the other (*Venus Meretrix.* See *pl.* 3. *f.* 26).

Venericardia. Shell nearly orbicular, inequilateral, with longitudinal ribs on the outer surface; two thick oblique hinge teeth, not diverging (*Venus imbricata.* See *pl.* 3. *f.* 27).

Capsa. Shell transverse, with two hinge teeth in one valve, and one bifid tooth intruded in the other (*Venus deflorata* Linn. See *pl.* 3. *f.* 28).

CHAPTER XIV.

OF THE *SPONDYLUS*. GENUS XI.

SPONDYLUS.

"Animal a *Tethys*. Shell strong, with unequal valves; hinge with two recurved teeth, separated by a small hollow."—LINN.

THERE are very few species discovered yet that belong to this genus; they somewhat resemble a Scallop in their general shape, and have the connecting cartilage internal like them, but differ in the beak of the lower valve, being separated from that in the upper by a truncated area, and in having two strong teeth in each valve, while the Scallop is without teeth; the teeth in the lower valve are separated by a small hollow that receives the cartilage; but the teeth in the upper valve are separated by three hollows, the centre one receiving the cartilage, and the other two receiving the teeth of the opposite valve.

Spondylus plicatus has the beaks of the two valves approaching, without the truncated space that is found in some others.

The animal is a *Tethys* or Oyster, and has only one muscular impression on the inner surface of each valve.

Linnæus describes 3 species, Gmelin has added 1, and Dr. Turton none. Total, only 4.

Lamarck divides these into two genera, as follows:

Spondylus. Shell inequivalved, eared, and rough or spinous, with unequal beaks, the inferior more produced, with a flat triangular face, parted by a groove; the hinge with two strong recurved teeth, and an intermediate hollow for the reception of the cartilage; one muscular impression (*Spondylus Gaderopus* Linn. See *pl.* 3. *f.* 29).

Plicatula. Shell inequivalved, without ears, the beaks unequal, without a face, having folds on the margin; hinge with two strong teeth in each valve, and an intermediate hollow for the reception of the cartilage; one muscular impression in each valve (*Spondylus plicatus.* See *pl.* 3. *f.* 30).

CHAPTER XV.

OF THE *CHAMA*. GENUS XII.

CHAMA.

> "Animal a *Tethys*. Shell bivalve, rather coarse; hinge with a callous gibbosity obliquely inserted in an oblique hollow; anterior slope closed." —LINN.

THE shells arran[illegible] in this genus vary very much in their general shape and appearance, as well as in their teeth. Many species are rough with spines, or with leaf-like scales, as *Chama Lazarus* and *gryphoides*; some have longitudinal ribs or ridges like the *Cardia*, as in *Chama antiquata* and *calyculata*; these last have a short thick tooth under the beak, and a longitudinal ridge under the cartilage in one valve, and a hollow under the beak and two longitudinal ridges in the other valve under the cartilage; but the ridge under the cartilage in *Chama Gigas* and *Hippopus* is not very long. When the valves are shut together in *Chama Gigas* there is an aperture left on that side of the beaks called the posterior slope; but in *Chama Hippopus* the valves shut close, without leaving any aperture.

The interior surface of the valves of *Chama Gigas* and *Hippopus* have only one muscular impression on each; most probably the animals of these are a species of Scallop or Oyster; the rest of the species have two muscular impressions on each valve. The animals are supposed to be Cockles.

Chama Cor is a smooth heart-shaped shell, and differs much from all the others; it has two teeth, with a deep hollow under the beak, and a lateral tooth under the further end of the cartilage in one valve, and one tooth under the beak and a lateral one at the end of the cartilage in the other. *Chama Moltkiana* and one or two more are described as varying from the rest in their teeth; they are but little known; the cartilage is external in all the species, but in some it is sunk in a hollow groove so as to be scarcely visible on the outside. In some species, as *Chama Cor*, the beaks are raised above the surface of the shell in a spiral form, somewhat resembling the horn of an animal.

Linnæus has described 14 species, Gmelin has added 11, and Dr. Turton none. Total, 25.

Lamarck has divided this genus into five, as follows:

Tridacna. Shell sub-transverse and inequilateral; the hinge with two compressed teeth inserted, the posterior depression gaping (see *Chama Gigas*, *f.* 31).

Hippopus. Shell sub-transverse and inequilateral; the hinge with two compressed teeth inserted, the posterior depression closed (see *Chama Hippopus*, *f.* 32).

Cardita. Shell inequilateral; hinge with two unequal teeth: the one which is short is under the beaks, and the other lengthened beneath the cartilage (see *Chama antiquata*, *f.* 33).

Isocardia. Shell heart-shaped; the beaks distant, turning to one side and diverging; the hinge with two teeth, flattened and inserted, and one distant lateral tooth under the cartilage (see *Chama Cor*, *f.* 34).

Chama. Shell adhering, inequivalved; the beaks unequal; the hinge with one thick oblique tooth; two muscular impressions in each valve (see *Chama Lazarus*, *f.* 35).

Perhaps we may place here the genus *Diceras* (see Park. Organ. Rem. vol. 3. p. 205), described as follows:

Diceras. A ventricose, transversely subrugose bivalve; the beaks distant, shaped like horns, and contorted in irregular spires.

CHAPTER XVI.

OF THE *ARCA*. GENUS XIII.

ARCA.

"Animal a *Tethys*? Shell bivalve; valves equal. The hinge with numerous acute teeth, alternate and inserted."—LINN.

THE shells of this genus are easily distinguished by the numerous small teeth which are arranged in [illegible]e (*f.* 38); which in some species is straight, as in *Arca Noæ*; in others it is bent like an arch, as in *Arca Pectunculus* (*f.* 37); and sometimes is bent like a broken line, as in *Arca Nucleus* (*f.* 36). The different species vary much in shape: some approach towards a boat-like form, as in *Arca Noæ*; these have the beaks separated to a considerable distance by a flattish space somewhat lozenge-shaped; some approach to the shape of a Cockle, as *Arca Pectunculus*. The cartilage is external in all.

The animal appears to be a species of Cockle, protruding two short tubes from one end of the shell, and a scythe-shaped foot at the front; but the animal of *Arca Noæ* seems to vary considerably from the rest; the margin of the valves opposite the hinge is a little hollowed, so that when shut together they leave an opening; the foot protrudes at that part, and is somewhat like the foot of the Muscle*; it ends in a flat horny tip, by which it holds itself to the rocks; it is short, not extending above two lines beyond the shell.

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* See Adanson, p. 251.

Linnæus has described 17 species, Gmelin has added 25, and Dr. Turton 1. Total, 43.

Lamarck has divided this genus into four, as follow:

Nucula. Shell nearly triangular or oblong inequilateral; the hinge on a line, bent at an angle, furnished with numerous transverse and parallel teeth; a principal tooth oblique and out of the row; the beaks approximate and turned backw[illegible] (see *Arca Nucleus, f.* 36).

Pectunculus. Shell orbicular, nearly equilateral; the hinge in a curved line, with numerous teeth, oblique and inserted; cartilage external (see *Arca Pectunculus, f.* 37).

Arca. Shell transverse and inequilateral, the beaks distant; the hinge with many teeth in a straight line, transverse, parallel, and inserted; cartilage external (see *Arca Noæ, f.* 38).

Cucullæa. Shell ventricose, nearly transverse, inequilateral; beaks distant; the hinge in a straight line, with many teeth set transverse and inserted, terminated at each end by two or three parallel to the side; cartilage external (see *Arca cucullata,* Chemn. vol. 7. t. 53, f. 526, 528).

In consequence of these differences it would perhaps be better to form four divisions in this genus, than to divide it into four distinct genera.

CHAPTER XVII.

OF THE *OSTREA*. GENUS XIV.

OSTREA.

"Animal a *Tethys*. Shell bivalve inequivalved, somewhat eared; hinge without teeth, with a little ovate hollow and lateral transverse stria."—Linn.

Linnæus makes four divisions of this genus, which includes both Scallops and Oysters. The first division consists of Scallops with the ears on each side, the beaks equal; the second division contains those that have one ear fringed as it were with spines, and generally unequal; the third has the shell on one side of the beaks more gibbous or swelled larger than the other; and the fourth consists of rough ones, or those commonly called Oysters.

The Scallops or *Pectens* have at the hinge a small hollow, nearly ovate or somewhat triangular, under the beaks in each valve, which hold the connecting cartilage (*pl.* 4. *f.* 41. *a*), but have no teeth; the cartilage of course is internal; there is on both sides of the beaks in each valve a somewhat triangular appendage or extension of the shell, called an ear (*pl.* 4. *f.* 41. *b b*). In some species, as *Ostrea maxima, Jacobea,* &c., the ears on each side the beaks are nearly equal: these are placed in the first division. In some, as *Ostrea varia, Pallium,* &c., the ears on one side the beak in each valve are much larger than those on the other side; the largest ear in one valve is also generally of a different shape from the corresponding one in the opposite valve: these constitute the second division of Linnæus. In both these divisions there are some of the species that have the valves unequal, one being flat and the other convex, as *O. maxima*, &c.; but perhaps the greater number of species have both valves equally convex, or nearly so, as *O. opercularis, sanguinolenta*, &c. None of these are fixed to the rocks or any other place, but swim about freely. The shells of the third division have likewise ears on each side the beaks, but they are very small; the hinge is differently constructed, and stands somewhat obliquely; the valves when shut together leave a small vacancy just below the ears, through which aperture the animal protrudes a foot a little similar to that of *Arca Noæ*, by means of which it attaches itself to any particular place, or removes itself from one place to another. The fourth division contains not only those commonly called Oysters, but also several others, the hinges of which are totally different: in the common Oysters which have no ears the valves are unequal, the upper one in general is flat, and the lower convex; but, as these shells are fixed to rocks or some other substance, it oftentimes depends on the form of the substance to which they happen to be attached, as in some cases the lower valve is flat and the upper convex. The hinge is without teeth, but there is often a crenature on the margin extending a little way on each side the hinge: in the upper valve there is scarcely any hollow for receiving the cartilage; but in the lower one there is a considerable one, which increases with age, and in some species extends to a considerable length, as in *O. spondyloides, cornucopiæ,* &c.; most of these can open their valves but a very little way, especially when they get old. The animal protrudes neither tube nor foot beyond the margin of the shell. Some species in this division have equal valves, as *O. Malleus, Vulsella,* &c.: these have not only a hollow for the cartilage in each valve, but also another very close to it (*f.* 39); they are said to fix themselves by a byssus which passes through this second hollow. There are also some other shells plac[illegible]y Linnæus in this division, as *O. Perna, Isogonum,* &c., which have the hinge very different from all the rest; there are no teeth at the hinge, but it consists of an uncertain number of grooves or hollows for holding the cartilage, ranged side by side in a straight line (*f.* 40): in some species there are but three or four of these grooves, while in some others, as *O. Isogonum,* there are often as many as fourteen or fifteen; perhaps the number may increase with age. The grooves are exactly opposite in each valve, and appear each to hold a separate cartilage; both the valves are very little convex; the animals are said to fix themselves by a byssus.

	Linnæus has described	Gmelin has added	Dr. Turton	Total.
In the 1st and 2d divisions,	19	72	3	94
In the 3d division,	3	4	0	7
In the 4th division,	9	25	1	35
Total,	31	101	4	136

Mr. Pennant, Mr. Montagu, and several others have separated the Scallops from this genus, and called them *Pectenes*. Lamarck divides this genus into six, as follow:

OSTREA. Shell adhering and inequivalved; hinge without teeth; an oblong hollow with ridges across it for the reception of the cartilage; only one muscular impression on each valve (see *Ostrea edulis*).

MALLEUS. Shell free, a little open near the beaks, fixing itself by a byssus; the valves equal; the hinge without teeth, a little swelling, and furnished with a conical hollow for the cartilage, placed obliquely on the edge of each valve, separate from the opening for the byssus (see *Ostrea Malleus*, *f.* 39).

PERNA. Shell flat and free, fixing itself by a byssus; hinge composed of several linear teeth, parallel and truncate, not articulating, arranged obliquely or transversely on a straight line; the interstices of the teeth in each valve receiving the cartilage (see *Ostrea Ephippium*, *f.* 40).

PECTEN. Shell eared; valves unequal, with contiguous beaks; the hinge without teeth; cartilage internal, fixed in a triangular hollow; one muscular impression (see *Ostrea opercularis*, *f.* 41).

LIMA. Shell inequilateral, eared, gaping a little on one side; the hinge toothless; the cartilage external; beaks distant (see *Ostrea Lima*, *f.* 43).

PEDUM. Shell eared; valves unequal, a little gaping; the beaks separated; hinge without teeth; the cartilage external, fixed in a long narrow groove, the lower valve hollowed (see *Ostrea spondyloides*, Chemn. vol. 8. t. 72. f. 669, 670).

Between *Perna* and *Pecten* will very properly come in a new genus formed by Lamarck for a shell lately brought from the Red Sea, which he calls *Crenatula.* Shell flat, irregular; hinge linear, crenulated, with a row of small roundish hollows which receives the cartilage; no byssus (see *Crenatula mytiloides*, *f.* 44).

CHAPTER XVIII.

OF THE *ANOMIA.* GENUS XV.

ANOMIA.

"Animal a strap-shaped body, emarginate and ciliate, with fringes fixt to the upper valve; arms two, linear, longer than the body, near together extending, alternate on the valve, both sides fringed, with fringes fixt to both valves. Shell with unequal valves, one of the valves flattish, the other more gibbous at the base, one of them often perforated at the base; hinge without teeth, with a linear prominent cicatrix and a lateral tooth within, but in the flat valve on the very margin. Two bony rays for the base of the animal."—Linn.

The different species which compose this genus of shells vary considerably in their form; most of them are thin and brittle, semi-transparent, of a pearly texture; in general they will be most readily known by having one of the valves perforated (*f.* 47. *a*): several species have the lower valve flat, and the upper convex, the flat valve having a large hole close to the hinge, through which a strong muscle or ligament passes: one end of this muscle is attached to the upper or convex valve, and, passing through the perforation in the flat valve, the other end is attached to a small operculum, which operculum is generally fixed to some other substance, as *A. Ephippium,* which is often found attached to the common Oyster. If the muscular impression on the convex valve in this species is examined, it will be found to consist of three parts, as if there were three ligaments close together; or, if one, it is at least divided into three parts. In some species the flat valve is perforated with three holes, as in *A. craniolaris*; whilst in some others the beak of the convex valve is much produced, having the tip perforated, as in *A. Caput serpentis*. Withinside some of the species there is found a kind of bone, bent or twisted in a curious manner, which serves for a support to the animal, as in *A. Terebratula*. There are other species in which both valves are flat, and nearly circular, without any perforation, so that they can never shut close at the circumference or margin, except merely at the hinge: the hinge in these is small, with two diverging ridges on the inside of one valve, and two corresponding hollows in the other, as in *A. Placenta* (*f.* 46).

A great many species of fossil shells have been found that are considered as belonging to this genus. The animals inhabiting these shells are very little known; but several of them appear to vary much from the others, and also from all other genera. Some of the animals have neither tube nor foot that they can protrude beyond the shell, but have two long arms to assist in swimming, ciliated on one side their whole length, which they roll up spirally within the shell when not in use, as in *A. Terebratula* and *vitrea*. The animal of *A. tridentata* has two flat arms somewhat scythe-shaped, and three-lobed, with which he swims in the sea.

Linnæus describes 27 species, Gmelin has added 24, and Dr. Turton none. Total, 51. But several of the species are fossil, and have not yet been found in a recent state.

Lamarck has divided this genus into seven, as follow:

Gryphæa. Shell with unequal valves, the lower valve concave, terminated by a beak, curved upwards and inwards, the upper valve much smaller, like an operculum; the hinge toothless, the hollow or pit oblong and arched; one muscular impression in each valve (see *Anomia Gryphus*, *f.* 45).

Placuna. Shell free, flat, with equal valves; the hinge with two longitudinal teeth or ribs on the interior surface of one valve diverging, or in form of a V; and on the other valve two corresponding hollows which serve for the attachment of the cartilage (see *Anomia Placenta*, *f.* 46).

Anomia. Shell irregular, with unequal valves, the lower valve perforated near the beak which aperture is closed with a little bony operculum attached to a cartilage passing through the hole or notch, and serving to fix it to other bodies (see *Anomia Ephippium*, *f.* 47).

Crania. Shell inequivalved, the lower nearly flat and round, pierced on its inner face with three unequal and oblique holes; the upper valve very convex, furnished on the interior surface with two projecting callosities (see *Anomia craniolaris*, Chemn. 8. t. 76. f. 687).

Terebratula. Shell regular, fixed by a ligament or short tube; the valves unequal, the larger of which has the beak produced and pierced with a hole, through which the ligament passes; the hinge with two teeth. Two thin branching bony rays projecting inside from the valve that is not pierced, which appear to serve as a stay or support to the animal (see *Anomia Terebratula* Linn., Chemn. 8. t. 78. f. 707, 709).

Calceola. Shell with unequal valves, the largest somewhat like a slipper, the smaller one flat and semicircular, like an operculum; the hinge with two or three little teeth (see *Anomia Sandalium,* Knorr Foss. 3. Supp. t. 206. f. 5 and 6).

Hyalæa. Shell with unequal valves, swelled and transparent, gaping under the beak, and tricuspidated at the base; valves united (see *Anomia tridentata,* Chemn. 8. vign. A to G. p. 65).

Mr. Parkinson* doubts of the propriety of making a distinct genus for the *Anomia Gryphus,* he having observed a series of gradation in the curve of the beak from the more complete curve of the *A. Gryphus* to the slight turn of the common Oyster; but he agrees with Mr. Martin in thinking that Lamarck's genus of *Terebratula* requires a still further division.

Retzius, in the *Nova Testaceorum Genera,* proposed to divide the genus *Anomia* into four, viz. *Anomia, Crania, Terebratula,* and *Placenta* (see Linn. Trans. vol. 7. p. 205).

Perhaps we may place here Lamarck's genus *Trigonia,* and Mr. Parkinson's *Harpax,* which are described as follow:

Trigonia. Shell inequilateral, nearly triangular; the hinge with two large flat teeth, diverging and transversely grooved (see Park. Organ. Rem. vol. 3. p. 172. t. 12. f. 1 and 2).

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* Organic Remains, vol. 3. p. 210.

Harpax. An adherent oblong and somewhat triangular inequivalved shell; the hinge formed by two long diverging crenulated teeth in one valve, and four in the opposite, disposed in the form of a V; the upper valve armed with pointed hooks; one mark of attachment (see Park. Organ. Rem. vol. 3. p. 221. t. 12. f. 14 to 18).

CHAPTER XIX.

OF THE *MYTILUS*. GENUS XVI.

MYTILUS.

"Animal an *Ascidia*? Shell bivalve, rough, often affixed by a byssus; hinge without teeth, distinguished by a subulate excavated longitudinal line."—LINN.

LINNÆUS makes three divisions of this genus. The first he calls "parasitical, affixed by claws." It contains only three species; the hinge in these is similar to that of the common Oyster, with which they agree in most other respects, except that the common Oysters are generally attached to rocks, stones, or other substances, and these affix themselves by claws to twigs, sticks, &c.; they have also but one muscular impression. Therefore it appears to be more proper to place these three, viz. *Hyotis*, *Frons*, and *Crista galli* in the genus *Ostrea*, as some authors have done.

The second division Linnæus calls "flat or compressed, appearing as if flat and somewhat eared." This consists of only two species, *M. margaritiferus* and *Unguis*. The hinges of both these differ from the genus *Mytilus*, and from that of *Ostrea*. If the animal is considered, it would lead one to place them near to *Ostrea Malleus*, as it has only one muscle, like the Oyster, and fixes itself by a byssus, like *Ostrea Malleus*.

The third division is distinguished by being "a little swelling" or somewhat convex. These are of various shapes: some species are nearly cylindrical, as *M. Lithophagus*; many are similar in form to the common Muscle; some few have the beaks placed at a little distance from the extremity, as in *M. Modiolus*; several species are nearly oval, with the beak and hinge about the middle of the long side, as in *M. cygneus* and *anatinus*. In this division the muscular impressions can but rarely be perceived on the inner surface of the shells, though in most of these the animal has four muscles, one of which is much larger than the others: it protrudes no tube, but only a strap-shaped foot, which it can extend to a considerable distance from the shell, and with which it forms the threads of the byssus (see *Spectacle de la Nature*, vol. 1. p. 137). In *M. Hirundo* the shell is extended on each side the beak; these parts are called wings; those which are on one side the beaks are much larger than those which are on the other; these have but one muscular impression, and that is scarcely to be perceived, as in the Scallops. The animal is nearly like that of *M. margaritiferus* or *Ostrea Malleus*, fixing itself by a byssus. The animal of *M. Lithophagus* has no byssus, neither has the animal of *M. stagnalis*, *cygneus*, and *anatinus*; they project a scythe-shaped foot, and are nearly like the animal of *Mya Pictorum* and *margaritifera*.

The animals of the first division, *Crista galli*, *Hyotis*, and *Frons*, are believed to be similar to the *Tethys* of Linnæus, or the common Oyster.

The hinges of the Muscles are very simple, being generally nothing more than an external cartilage fixed to the edge of each valve; sometimes there are a few small teeth on the edge, but oftener a longitudinal ridge just withinside. The shells are said to be longitudinally striate when marked with lines from the beak to the rounded end, and transversely striate when marked with lines across those.

Linnæus has described in the first division 3 species, in the second 2, and in the third 15: in all, 20; Gmelin has added to the third division 38; Dr. Turton has added to the third division 6. Total, 64.

Lamarck places some of the species with the Oysters, and divides the rest into the five following genera:

Mytilus. Shell longitudinal, terminated by a straight beak, lengthened to a point, fixing itself by a byssus; hinge generally without teeth; only one muscular impression (see *Mytilus edulis,* the common Muscle).

Modiola. Shell subtransverse, the posterior side very short, with the beaks turning toward the short side; the hinge without any teeth; only one muscular impression (see *Mytilus Modiolus, f.* 48).

Anodonta. Shell transverse, having three muscular impressions; hinge without any teeth (see *Mytilus anatinus, f.* 49).

Avicula. Shell free, valves unequal, a little gaping near the beaks, fixing itself by a byssus; the hinge without teeth, a little swelling; the hollow for the cartilage oblong, marginal, and parallel to the edge to which it is attached (see *Mytilus Hirundo* Linn. f. 50).

LINGULA. Shell flat, long, with nearly equal valves, truncated before; the hinge without teeth; the beaks pointed and united to a tendinous tube, which serves for a cartilage to the shell, and fixes it to any marine substance (see *Patella Unguis* Linn.; *Mytilus Rostrum* of Shaw and Turton; Chemn. 10. t. 172. f. 1675, 1676).

The animal of this last is furnished with two very long arms, ciliated, like the animal of the *Anomia Terebratula.*

Lamarck does not appear to be quite correct in describing *Mytilus edulis* as having only one muscular impression; it has only one large; the others are but small, and not easily perceived. In *anatinus* there are two conspicuous ones, the other is obscure.

CHAPTER XX.

OF THE *PINNA*. GENUS XVII.

PINNA.

"Animal a *Limax*. Shell nearly bivalve, brittle, upright, throwing out a bearded byssus; hinge without teeth; valves united in one."—LINN.

THE shells of this genus are broad at the upper end, tapering to a blunt point below (*pl.* 4. *f.* 51); they are thin and mostly rough; they do not shut close at the broad end, and are somewhat similar in texture to the shell of the Muscle. The valves are equal and nearly flat; they are connected by a very long external cartilage, extending about half the length of the shell from the pointed end upwards. There is not any appearance of teeth at the hinge. There must be surely some mistake in Linnæus's calling the animal a *Limax*; it appears to differ but little from the animal of the common Muscle (see Adanson, p. 212); it fixes itself by a large byssus, of which a kind of silk gloves are made at Palermo (see *Spectacle de la Nature*, vol. 1. p. 141).

Linnæus has described 8 species, Gmelin has added 10, and Dr. Turton none. Total, 18.

Lamarck has made no alteration in this genus.

PINNA. Shell longitudinal, wedge-shaped, pointed at the base, open at the upper end, and fixing itself by a byssus; the hinge without teeth; the cartilage external, very long (see *Pinna rudis* Linn. f. 51).

CHAPTER XXI.

OF THE *ARGONAUTA.* GENUS XVIII.

ARGONAUTA.

"**Animal a *Sepia*. Shell univalve, spiral, involute, membranaceous, and one-celled.**"—LINN.

THIS genus is very distinct from all the rest. The shells of the few species at present known are very thin, somewhat boat-shaped (*pl.* 5. *f.* 53); one end is slightly rolled or curved inwards; the aperture or mouth is somewhat heart- or arrow-shaped; the outer part or back of the shell is called the keel.

The animal is nearly allied to the *Sepia* or Cuttle-fish. This is one of the few shells that swims in the sea, and not unfrequently on the surface.

Linnæus describes only two species, Gmelin has added 3, and Dr. Turton none. Total, only 5.

Lamarck has divided this genus into two, as follow:

CARINARIA. Shell univalve, very thin, like a cone, flattened at the sides, the apex terminating in a very small involuted spire, the back having a dentated keel; the aperture entire, oval, oblong, contracted towards the angle of the keel (see *Argonauta vitrea*, Favanne, t. 7. f. C 2).

Argonauta. Shell univalve, very thin, boat-shaped, the spire rolled into the aperture, the keel of the back double and tuberculated (see *Argonauta Argo*, *f.* 53).

CHAPTER XXII.

OF THE *NAUTILUS.* GENUS XIX.

NAUTILUS.

"Animal (RUMPH. *Mus.* t. 17. f. D). Shell univalve, with many cells; the partitions arched and perforated."—LINN.

THERE are a great variety of shells included in this genus, of which the far greater number are only found in a fossile state; many of those found recent are very minute; the essential character consists in the shell being divided into many chambers. Many species are nearly wheel-shaped; some with the outer whorls enveloping the whole, as *N. Pompilius* (*f.* 54), and others with the outer whorls attached to the preceding ones, leaving the inner or centre whorls conspicuous on both sides, as *N. Beccarii* (*f.* 58); some few have the whorls a little separated, but spiral, like a horn, as *N. Spirula* (*f.* 55); others again are not spiral, but only a little bent, as *N. obliquus* (*f.* 56); and some quite straight, as *N. Fascia* (*f.* 57); in some species the whorls are cylindrical; others are compressed, as *N. Raphanus*, and consequently the shape of the mouth is various; some are smooth on the outer surface, and some are wrinkled. The divisions between the chambers are generally perforated by a tube, which in some species is near the centre, in others near the circumference.

The animal is supposed to be a kind of *Sepia.*

Linnæus has described 17 species, Gmelin has added 7, and Dr. Turton 7. Total, 31.

Lamarck has divided this genus into 19, to which Mr. Parkinson has added 3, making together 22, as follows:

NAUTILUS. A spiral, somewhat wheel-shaped univalve; the last whorl covering the others, the partitions of which are simple; the chambers numerous, formed by transverse simple partitions perforated by a tube (see *N. Pompilius, f.* 54).

ORBULITES. Shell spiral, somewhat wheel-shaped; the last whorl envelops the others, and of which the internal part is joined by sinuous sutures; the transverse partitions are pierced by a marginal tube (see *N. Cornu Ammonis læve,* Bourguet Tr. des Petrific. t. 48. no. 311).

AMMONITES. Shell spiral and wheel-shaped; the turns contiguous and all apparent; the internal parts joined by sinuous sutures. The transverse partitions waved, and pierced by a marginal tube (see *N. Cornu Ammonis.* Parkinson's Organ. Rem. 3. p. 133. t. 9. f. 5 to 9).

PLANULITES. Shell spiral and wheel-shaped, the whorls contiguous, and all appearing and having the divisions simple; the transverse partitions entire (see Bourguet's Petrific. t. 46. f. 290.)

NUMMULITES. Shell lenticular and wheel-shaped; the divisions simple, covering all the whorls; chambers numerous, formed by transverse partitions; imperforate (see Park. Organ. Rem. 3. p. 148. t. 10. f. 13 to 27).

Spirula. Shell partially or completely spiral and wheel-shaped; the whorls separated; the last whorl especially elongated in a right line; the transverse partitions simple, and pierced by a tube; the aperture circular (see *N. Spirula, f.* 55).

Turrilites. Shell spiral and turbinated; the whorls contiguous and all apparent; the internal part joined by sinuous sutures; the transverse partitions lobed and pierced; the aperture round (see Park. Organ. Rem. 3. p. 146. t. 10. f. 12).

Baculites. Shell straight, cylindrical, and rather conical, divided into chambers by transverse, sinuous, and imperforate partitions; the sutures indented like the battlements of a tower (see Park. Organ. Rem. 3. p. 142. t. 9. f. 2).

Orthocera. Shell straight or arched, rather conical; the chambers distinct, formed by transverse simple partitions, perforated by a central or lateral tube (see *N. Fascia, f.* 57, and Park. Organ. Rem. 3. p. 111. t. 7. f. 14).

Hippurites. Shell conical, straight, or arched, furnished internally with transverse partitions, and with two longitudinal, lateral, obtuse and converging ridges; the last chamber closed by an operculum (see Park. Organ. Rem. 3. p. 118. t. 8. f. 1 and 5).

Belemnites. Shell straight, like a long cone, pointed, full at the summit, and furnished with a lateral gutter; only one chamber apparent and conical; the former having been successively effaced by the filling up of the partitions (see *Belemnites*, Park. Organ. Rem. 3. p. 122. t. 8. f. 8 to 15).

Discorbis. A spiral discoidal univalve; the turns all contiguous, uncovered, and perceptible; the septa transverse, whole, and frequent (see Park. Organ. Rem. 3. p. 159. t. 11. f. 1).

Rotalites. A convex, conical, spiral, multilocular, univalve, slightly radiated beneath; the opening marginal, trigonal, and rather turning downwards (see Park. Organ. Rem. 3. p. 160. t. 11. f. 2 and 3).

Lenticulina. A sublenticular, multilocular, spiral univalve; the external margin of the turns being complicated, the septa reaching to the centre on each side: the septa entire, curved, and standing out, on the upper and under surface, like rays; the aperture narrow, and projecting beyond the penultimate turn (see Park. Organ. Rem. 3. p. 161. t. 11. f. 4).

Lituola. A multiloqular univalve, partly spiral, the last turn being straight at the end; the chambers irregular; plain transverse septa, the last having several openings (see Park. Organ. Rem. 3. p. 161. t. 11. f. 5 to 7).

Spirolina. A multilocular shell, in part spirally convoluted; the turns contiguous, the latter ones straight; the septa transverse, and perforated by a tube (see Park. Organ. Rem. 3. p. 161. t. 11. f. 8 and 9).

Miliola. A transverse ovately-globose or elongated multilocular shell, with transverse chambers, involving the axis alternately and in three directions; the aperture small and circular, or oblong at the base of the last chamber (see Park. Organ. Rem. 3. p. 162. t. 11. f. 11 to 20).

Renulina. A flat, sulcated, kidney-shaped, multilocular shell, with linear chambers adapted to the curves of the shell, the last being longest; the axis marginal (see Park. Organ. Rem. 3. p. 163. t. 11. f. 21).

Gyrogonites. A sphæroidal hollow shell, composed of linear curved pieces, slightly grooved at the sides, where they are joined; by the joining of which grooves linear chambers appear to be formed, following the direction of the pieces; at these joinings on the external surface are carinated ribs, disposed transversely about the middle, and spirally at each pole of the shell. At one of the poles there is sometimes to be seen a circular aperture, which sometimes appears to be closed by a particular valve or operculum (see Park. Organ. Rem. 3. p. 164. t. 11. f. 23).

The three following are from Mr. Parkinson (see Organ. Rem. vol. 3. p. 143).

Hamites. A multilocular hook-formed shell, with sinuous septa, with no evident siphunculus (see Park. Organ. Rem. 3. p. 144. t. 10. f. 1 to 5).

Scaphites. A concamerated shell, commencing with spiral turns, the last of which, after being elongated, is reflected towards the spiral part (see Park. Organ. Rem. 3. p. 145. t. 10. f. 10).

FASCIOLITES. A subcylindrical shelly or bony body, about half an inch in length, rather tapering at the ends, and formed by the spiral arrangement of perpendicular concamerated tubes, the tapering end of each of which is obliquely and transversely folded on that of the preceding one (see Park. Organ. Rem. 3. p. 158. t. 10. f. 28 to 31).

CHAPTER XXIII.

OF THE *CONUS*. GENUS XX.

CONUS.

"Animal a *Limax*. Shell univalve, convolute, turbinate; the aperture effuse, longitudinal, and linear, without teeth, entire at the base; pillar smooth."—Linn.

The shells of this genus are rolled up in somewhat of a conical or cylindrical form (*pl.* 5. *f.* 59 and 60), the turns or volutions being apparent at one end only, which end is called the spire (*pl.* 5. *f.* 60. *a*); the other end is called the base by Linnæus; the spiral end Linnæus calls the fore part.

The aperture, which is called the mouth, is narrow; the end furthest from the spire is open or effuse, and nearly as long as the whole shell (*pl.* 5. *f.* 60. *b*); the outer side of the aperture is generally called the outer lip (*pl.* 5. *f.* 60. *c*), which in this genus commonly has an acute edge; the other side of the aperture, which is formed by the body of the shell, is called the inner or pillar lip.

The essential character of this genus seems to be a longitudinal aperture with both sides or lips smooth, open at the end furthest from the spire, which is as it were truncate. This genus is clearly distinct from any other.

Linnæus makes four divisions, which appear to be but of little use, the species varying by such small differences that it is frequently very uncertain in which division they should be placed. The first, those with the spire nearly truncate, he calls *Truncati*, the second *Pyriformes*, the third *Elongati*, and the fourth *Laxi*.

The animal is small in proportion to the size and weight of the shell; it is a kind of Snail, and, like all the water species, has only two horns, which are cylindrical; it has two eyes, one on each horn, not at the tip, but on the exterior side, at about one-sixth part of its length from the point; it has a breathing tube or windpipe, which projects beyond the shell in length about one-fifth part of the length of the shell (see *pl.* 5. *f.* 59); it has a thin horny operculum attached to its foot, with which it closes a part of the aperture, and is of an oval figure; its length is only equal to one-fifth of the length of the aperture; the breadth is about one-half the length (see Adanson, p. 89).

The terms longitudinal and transverse are too often used indiscriminately in this genus.

Linnæus has described 35 species, Gmelin has added 36, and Dr. Turton none. Total, 80.

M. Adanson has not made any alteration in this genus, but makes it the first with an operculum, and names it *Rouleau*.

Lamarck has not made any alteration; his description is as follows:

Conus. Shell turbinated (like a cone reversed), rolled on itself; the aperture longitudinal, straight, not toothed, effuse at the base (see *Conus marmoreus* and *Mercator*, *f.* 59 and 60).

CHAPTER XXIV.

OF THE *CYPRÆA*. GENUS XXI.

CYPRÆA.

"Animal a *Limax*. Shell univalve, involute, nearly oval, obtuse, smooth; aperture open at both sides, linear, both sides toothed, longitudinal."—LINN.

THE shells of this genus are somewhat egg-shaped, with the under side more or less flattened. The aperture, which is commonly very narrow, is nearly in the middle of the flattened part, reaching from end to end; each end terminates in a hollow; both sides of the aperture, which are called lips, are toothed. In some species a small part of the spire may be seen; this is frequently the case with young shells, but in adults it can very seldom be perceived, and then scarcely more than the apex or point, but most commonly in perfect shells the spire is completely hid; in a few there is found a small hollow or indent in the place of the spire; these are said to be umbilicated.

The animals inhabiting the *Cypræa* are supposed to cast their shells frequently during their growth, as Crabs and Lobsters do; for, if it was not so, in the larger shells would be found the remains of the mouth and teeth which had been formed when they were small; this is seen in most *Buccina* and *Murices*; for in the *Cypræa* the small shells are always found as complete, *i. e.* with the aperture or mouth as perfectly formed as the larger ones of the same species.

There are sometimes found some very thin shells with a twisted pillar, a little resembling in shape *Bulla Ficus* (*pl.* 5. *f.* 61. *c*); these are supposed to be the young and imperfectly formed shells of the *Cypræa* soon after casting the others, and to have been mistaken sometimes by authors for a distinct species: perhaps *Conus bullatus* of Linnæus is one of these. Adanson describes one (p. 75) somewhat similar, which he calls *Potan*; he says it is the most thin and brittle shell of any that is found in the sea; he describes the animal as resembling the animal of the *Cypræa*, but not as being the same; he also says it is somewhat like the animal of *Voluta glabella*, &c.; but he seems not to know, or even suspect, that the *Cypræa* change their shells. More information on this subject is much to be desired, particularly as this circumstance is not known or supposed to take place in any other genus of shells.

This genus is very distinct from every other. The essential character is the aperture toothed on both sides, with a hollow at each end.

The animal is a kind of Snail with two horns (*pl.* 5. *f.* 61. *a*), which are somewhat conical, tapering to a very fine point; they are about one-third as long as the shell; the eyes are on the exterior side, at about one-fifth of their length from the base; the breathing tube is very short, not extending beyond the shell (*pl.* 5. *f.* 61. *a*); but what is most remarkable is a membrane on each side of the animal, which it extends over the sides of the shell, meeting near the back.

These shells are not covered with a periosteum as most are; they have no operculum.

Linnæus describes 44 species, Gmelin has added 70, and Dr. Turton 6. Total, 120.

Both Adanson and Lamarck make this a distinct genus, without any alteration.

Lamarck describes it as follows:

CYPRÆA. Shell oval, convex, the edges rolled inwards; the aperture longitudinal, straight, and toothed on both sides (see *Cypræa Caput serpentis* Linn. *f.* 61. *b*).

CHAPTER XXV.

OF THE *BULLA.* GENUS XXII.

BULLA.

"Animal a *Limax*. Shell univalve, convolute, unarmed; the aperture somewhat compressed, oblong, longitudinal, very entire at the base; pillar oblique, smooth."—Linn.

The description of the aperture here is rather vague; what the essential character of this genus is seems very difficult, if not impossible, to determine; and, if we examine the shells called *Bullæ* by Linnæus, the forms of the apertures are so various that we must conclude no essential character can be drawn from that part any more than from the pillar, which in many other shells is oblique also, as in all the *Cypræa*, many *Volutæ*, &c. &c. By the term pillar Linnæus means the inner edge or axis which runs through the centre of the shell, from the point of the spire to the opposite point or end.

Linnæus himself seems not to have clearly determined in his own mind what should be a *Bulla* and what should not; for several species which he had in his former publications arranged under other genera he has in his twelfth edition of *Systema Naturæ* placed among the *Bullæ*, as *B. Ficus*, *Rapa*, and *virginea* (*f.* 64 and 66): he also expresses some doubts of some other species, as *B. Terebellum* and *achatina*.

The species placed together under this genus are certainly very various; the *B. Ovum* and *verrucosa* differ but little from the *Cypræa*, scarcely in any thing but in the teeth being wanting on one lip. The *B. Volva, birostris, Spelta, gibbosa*, &c. gradually approach to the form of the *Cypræa*, but have no teeth on either lip. *B. Naucum, aperta* (*f.* 62), *Hydatis, Ampulla* (*f.* 65), *lignaria, Physis, Amplustra*, &c. are somewhat globular in shape, with a large aperture, and the edge of the outer lip very thin and acute; these may perhaps be considered as the true *Bulla*, but even these differ considerably from one another.

B. Ficus (*f.* 64), *Rapa*, and those with the straight canal, which is the essential character of the *Murex*, would seem to arrange better in that genus, where indeed Linnæus had placed them in his *Musæum Ludovicæ Ulricæ*.

B. fontinalis, hypnorum, achatina, &c. agree with many species of the *Helix*.

B. Terebellum (*f.* 63) seems more like a *Cone*; Linnæus remarks that it has the aperture of a *Cone*.

What is known of the animals inhabiting these shells proves only the great variety there is among them, and the impropriety of classing them together. The animals of *B. aperta, lignaria* (see *pl.* 11. *f.* 16), *Hydatis*, &c., and probably of several others, are much larger than the shell, and appear like Mollusca, having the shell concealed under the skin, somewhat similar to the shield of the *Laplisia*; these have no tentacula, but two small eyes on the top of the head, and a curious structure of a gizzard or stomach, which is well described in Linn. Trans. vol. 2. t. 2. f. 18.

Linnæus describes 23 species, Gmelin has added 27, and Dr. Turton 2. Total, 52.

Lamarck divides this genus into seven, as follow, the first of which he places with the Naked Mollusca.

Bullæa. Body creeping, oval-oblong, and convex, bordered with membranes, which envelop it; the head naked, without tentacula or horns; the hinder part of the body furnished with a broad shield, including and covering the gills, and containing the shell-like body (*Bulla aperta* Linn. See *f.* 62).

Ovula. Shell tumid, more or less elongated to a point; at the two ends the edges rolled inwards; the aperture longitudinal, with no teeth on the left side (see *Bulla Ovum*, Gualter. Test. t. 15. f. A.B.).

Terebellum. Shell nearly cylindrical, spire-pointed; the aperture longitudinal and narrow at the upper part, with a hollow at the base, and the pillar truncated (see *Bulla Terebellum*, *f.* 63).

Pyrula. Shell nearly pear-shaped, channelled at the base; the upper part swelling, with a short spire, without any suture or ridge on the outside; the pillar smooth, without any notch or hollow on the right lip (see *Bulla Ficus*, *f.* 64).

Bulla. Shell swelled or gibbous; the spire within concealed;

the aperture the whole length of the shell; the right lip acute; no umbilicus at the base (see *Bulla Ampulla, f.* 65).

Achatina. Shell oval or oblong; the aperture entire, longer than wide; the pillar smooth, truncated at the base (see *Bulla virginea, f.* 66).

Volvaria. Shell convoluted and cylindrical, without any projecting spire; the aperture narrow, the whole length of the shell, with one or more folds at the base of the pillar (see *Bulla cylindrica, f.* 67).

CHAPTER XXVI.

OF THE *VOLUTA*. GENUS XXIII.

VOLUTA.

"Animala *Limax*. Shell one-celled, spiral; aperture not lengthened, somewhat hollowed; pillar with folds; lip with no hollow."—LINN.

THERE is a great variety in the form of the mouth as well as in the shape of the shells which are arranged together under this genus. Some, as *V. Oliva, porphyria*, &c., are nearly allied to the genus *Conus*; in others, as *V. Cymbium, Olla*, &c., the form of the mouth approaches to that of the *Bulla Ampulla* and *lignaria*. *V. marginata* resembles a *Cypræa*, and *V. reticulata, cancellata*, &c., scarcely can be said to differ from the *Buccina*; while some others, like *V. Pyrum*, have the aperture ending in a straight canal, which is the essential character of the *Murex*; and *Auris Midæ* and some others differ but little from the *Helix*.

The essential character of the *Voluta* is considered to be the folds on the pillar lip, or, as they are oftentimes called, the teeth. These folds or teeth are in some species oblique, as in *V. indica* and *Cymbium*; and in others transverse, as *V. musica*; while in several they are very obscure, if not wanting, as *V. rustica, mercenaria, Tringa*, &c.

This is by no means a natural genus; and as almost every other genus of Univalves contains several species that have teeth on the pillar-lip, this becomes very indeterminate and uncertain. Many of the *Buccina* in Linnæus's second division, as *tuberosum*, *Testiculus*, &c. have very conspicuous teeth on the pillar: so also have some of the *Strombi*, as *Chiragra*, &c.; and many among the *Murices*, as *Tritonis*, *Tulipa*, &c.; also several among the *Trochi*, as *dolabratus*; and *Turbo*, as *Uva*; also *Helix*, as *Scarabæus*; and *Nerita*, as *grossa*, &c.

There are not many of the animals known, but the few that are, vary very considerably from one another (see Adanson).

The lines and marks are denominated the same as in other spiral shells.

Linnæus describes 46 species, Gmelin has added 96, Dr. Turton 2. Total, 144.

Linnæus makes five divisions.

The 1st, *Apertura integra*,
2nd, *Cylindroideæ*,
3rd, *Ovatæ*,
4th, *Fusiformes*,
5th, *Ventricosæ*.

Perhaps the last division may not improperly be considered as the true *Voluta*. They seem to be sufficiently different from the rest, and from every other genus, to be esteemed a genus of themselves: in these the pillar is twisted with oblique folds; the last whorl is very large, bearing no proportion to the others; the aperture broad, with a hollow at the end furthest from the spire; outer lip thin, margin acute; spire often covered, or nearly so, with the outer whorl. The animal is very remarkable; the foot is so large, that the shell covers only about one-fourth part of it (*pl.* 10. *f.* 1 and 2); the head is very broad; at the under side it has a long cylindrical trunk, with the mouth at the extremity; the breathing tube short, projecting nearly the length of the head, with two small triangular flat horns, and the eyes placed on the head a little behind them (*pl.* 10, *f.* 2); it has no operculum.

Lamarck has divided this genus into nine, as follow:

Oliva. Shell subcylindrical, hollowed at the base; the whorls of the spire separated by a channel; pillar obliquely striated (see *Voluta porphyria, f.* 68).

Ancilla. Shell oblong; the spire short, not channelled; the base of the aperture slightly hollowed and effuse; a thick oblique swelling at the base of the pillar (see *Voluta Oliva, f.* 69).

Voluta. Shell oval, more or less ventricose; the spire obtuse, like a nipple; the base hollowed, without a canal; the pillar with folds, of which the inferior are largest and longest (see *Voluta musica, f.* 70).

Mitra. Shell turrited or subfusiform, with a pointed spire; the base hollowed without a canal; the pillar with folds, the inferior ones of which are the smallest (see *Voluta papalis, f.* 71).

Columbella. Shell oval, with a short spire; the base of the aperture more or less hollowed, without a canal, having a swelling on the internal part of the right lip, and folds or teeth on the pillar (see *Voluta mercatoria, f.* 72).

MARGINELLA. Shell oval-oblong, smooth; spire short; the right lip with a margin thickened on the outside; the base of the aperture more or less hollowed, with folds on the pillar (see *Voluta glabella, f.* 73).

CANCELLARIA. Shell oval or a little turrited, with the right lip sulcated internally; the base of the aperture with a slight channel, almost entire; some folds on the pillar sharp or compressed (see *Voluta cancellata, f.* 74).

TURBINELLUS. Shell turbinated or subfusiform, with a channel at the base; the pillar with three to five compressed transverse folds (see *Voluta Pyrum, f.* 75).

AURICULA. Shell oval or oblong; spire protruded; the aperture entire, longer than wide, narrowed upwards; pillar with one or more folds (see *f.* 76).

CHAPTER XXVII.

OF THE *BUCCINUM*. GENUS XXIV.

BUCCINUM.

"Animal a *Limax*. Shell univalve, spiral, gibbous; aperture ovate, terminating in a canal (blunt hollow) to the right; tail obtuse; inner lip smooth."—Linn.

The shape of the aperture or mouth of the shell varies much in this genus. Some species have a straight narrow mouth almost like the *Cypræa*, toothed sometimes on one side, but oftener on both, as *B. tuberosum*, *Testiculus* (*pl.* 6. *f.* 84), &c.; these commonly have the canal at the end furthest from the spire, a little bent towards the right side, when you hold the shell with the mouth upwards, with the canal forwards; but if you turn the shell over, that is, place it in its natural position, when the animal is crawling on the ground, then the canal bends towards the left side. These shells are mostly placed in the second division of Linnæus, and by him called *Cassidea*. Some of the other species have a hollow only in place of the canal before mentioned, appearing somewhat as if truncate, with the mouth very large, as *Dolium* (*pl.* 6. *f.* 82), *Galea*, &c.: these belong to Linnæus's first division, *Ampullacea*. There are many species intermediate between these, composing the third, fourth, fifth, sixth, and seventh divisions. The eighth division, containing the tapering ones, would perhaps make a genus of themselves. As there are some peculiarities in the form of these last that do not agree with the other shells of this genus, perhaps it would be found convenient to make one or two new genera out of the other seven divisions, where there is so much variety both in the form of the mouth and in many other particulars.

The essential character of the *Buccinum* appears to be the canal leaning to the right; but then, as was observed before, the shells must be reversed from their natural positions: but this description does not well apply to those shells like *Olearium* and *Galea*, which have only a truncated hollow, and not a canal extending beyond the surface of the shell: accordingly we find many shells with this kind of hollow placed among the *Murices*, in the division *Ecaudati*, as *M. Ricinus*, *Hippocastanum*, &c.

There are not many of the animals known that inhabit these shells, and those that are known do not differ much from the animals of the *Murices*; they all protrude their heads from under the end furthest from the spire; the breathing tube passing through the canal or hollow at that end is generally in length about one-sixth part of the whole length of the shell; the horns and eyes are like the *Cypræa*; most of them have a thin cartilaginous operculum; the animals of the tapering shells differ a little from the others, but agree nearly with those of the tapering *Murices*.

Linnæus divides the *Buccina* into eight divisions, which he names as follows:—first, *Ampullacea*; second, *Cassidea caudata*; third, *Cassidea unguiculata*; fourth, *Callosa*; fifth, *Detrita*; sixth, *Lævigata*; seventh, *Angulata*; and eighth, *Turrita*.

The spiral striæ are generally called transverse, and the contrary ones longitudinal.

Linnæus has described 51 species, Gmelin has added 121, and Dr. Turton 28. Total, 200.

Lamarck has divided this genus into eight, as follow:

Nassa. Shell oval, the aperture ending at the lower end in an oblique hollow turning upwards toward the back; the left lip thickened, forming on the pillar, which it covers, a transverse fold at the upper part, and having its base obliquely truncated (see *Buccinum Arcularia*, *f.* 77).

Purpura. Shell oval, generally rough, with spines or tubercles; the aperture ending at its base in a short oblique channel, hollowed at the extremity; the pillar naked, flat, and terminating in a point at the base (see *Buccinum Lapillus*, *f.* 78).

Buccinum. Shell oval or lengthened; the aperture oblong, with a hollow at the base, without a canal; the hollow is uncovered at the front part; pillar convex and full, without any flattening at the base (see *Buccinum undatum*, *f.* 79).

Eburna. Shell oval or elongated, smooth, the right edge very entire; the aperture oblong, with a hollow at the base; the pillar umbilicated, and slightly grooved at the base (see *Buccinum glabratum*, *f.* 80).

Terebra. Shell turrited; the aperture with a hollow at the base, and about one-third of the length of the shell; the base of the pillar twisted or oblique (see *Buccinum maculatum*, *f.* 81).

Dolium. Shell swelled, nearly globular, with circular ribs; the right lip crenated or toothed its whole length; the aperture oblong, very large, with a hollow at the base (see *Buccinum Dolium*, *f.* 82).

Harpa. Shell oval or ventricose, with longitudinal sharp ribs; the aperture oblong, large, with a hollow at the base, and no canal; the pillar smooth, ending in a point (see *Buccinum Harpa*, *f.* 83).

Cassis. Shell ventricose; the aperture longitudinal, terminating at the base in a short canal bent towards the back of the shell; the right lip margined outwardly; the pillar with folds at the lower end (see *Buccinum cornutum jun.*, *f.* 84).

CHAPTER XXVIII.

OF THE *STROMBUS*. GENUS XXV.

STROMBUS.

"**Animal a *Limax*. Shell univalve, spiral; side enlarged; aperture, lip often dilated, ending in a canal to the left."—Linn.**

The essential character of this genus is an obtuse indent or hollow on the margin of the outer lip, near to the canal which terminates the aperture; this additional hollow is to the left when the shell is placed with the mouth upwards, and consequently if placed in its natural position it is on the right.

These are commonly thick strong shells, and many of them are defended by a kind of horns or claws, which extend in various directions from the edge or margin of the outer lip, when they come to their full growth: the form of the mouth is various; in some it is very small in proportion to the whole shell, as in S. *Pes pelecani*; it is sometimes toothed on one or both sides, as in S. *Scorpius*; some have the mouth very large, with smooth lips, as S. *Gigas*: this genus is clearly distinguished by the additional hollow on the margin of the outer lip.

Linnæus makes four divisions; the first called *Digitati*, the second *Lobati*, the third *Ampliati*, and the fourth *Turriti*.

The shells of the last division, of which Linnæus describes only four, together with S. *Oniscus*, can scarcely be said to have an additional hollow; at least, if they have any, it is very obscure; whereas it is very large and conspicuous in most of the species. The mouths of the tapering *Strombi* agree very nearly with some of the tapering *Murices*.

I cannot find that the animals of these shells are described by any author except Adanson, and he only takes notice of that of one species, which he says is almost like the animal of the *Murices*; but as *Strombus Gigas* is so common a shell, most probably the animal is known to many.

Linnæus has described 29 species, Gmelin has added 22, and Dr. Turton 2. Total, 53.

Lamarck has divided this genus into three, as follow:

STROMBUS. Shell ventricose; the base terminating in a short hollow or truncated canal; the right lip enlarges with age into a wing, entire or with only one lobe, having at the lower part a hollow or groove distinct from that at the base (see *Strombus pugilis*, *f.* 85).

PTEROCERA. Shell ventricose; the base terminating in a lengthened canal; the right lip dilating with age into a digitated wing, and having a hollow groove near the base (see *Strombus Lambis*, *f.* 86).

ROSTELLARIA. Shell fusiform; the base terminating in a canal like a sharp beak; the right lip entire or toothed, more or less dilating with age into a wing, and having a hollow very near to the canal (see *Strombus Fusus*, *f.* 87).

Many of the turrited *Strombi* are placed by Lamarck in his genus *Cerithium*, and *Strombus spinosus* in the genus *Voluta*.

Strombus Oniscus is placed by Scopoli in the genus *Conus*.

CHAPTER XXIX.

OF THE *MUREX*. GENUS XXVI.

MUREX.

"Animal a *Limax*. Shell univalve, spiral, rough, with membranaceous sutures; aperture ending in a canal, whole, straight, or a little ascending."—LINN.

THE essential character of this genus consists in the straight canal or beak that terminates the mouth at that part which is called the base by Linnæus.

There is some variation in the form of this canal, as well as of the mouth: some shells have a long straight open canal or gutter, as *M. cornutus*, *Spirillus*, &c.; others have it long, but almost closed, as *M. Haustellum*, &c.; in some it is not so long, but entirely closed, forming a complete tube, as *M. tripterus*; in others short and open, as *Morio*: sometimes it turns up towards the back of the shell, which Linnæus calls ascending, as *M. Anus*, *Aluco*, &c.: many have no canal projecting beyond the surface of the shell, but appear as if truncate, with only a hollow like some of the *Buccina*, as *M. Ricinus*, and most of the fourth division *Ecaudati*.

The aperture in some is oval, as *Haustellum*; in many it is oblong and somewhat pointed at the ends, as *Lotorium*; in some it is large, as in *Melongena*; in others it is almost linear, as in *Ricinus*; and sometimes of an irregular figure, as *Anus*; also it frequently has teeth on one or both sides, though sometimes it is without any.

The outer surface of these shells is generally rough, with ridges, tubercles, or spines. Many species seem to have a periodical growth; they appear at certain times to cease growing, when they thicken the outer lip, and form the teeth at the aperture: the mouth is then said to be completely formed; after a certain time they grow again, and form another mouth, as before: the distance between varies in the different species. The ridge where the former mouth was formed is then called a suture; the distance between the sutures is in many species two-thirds of the circle; in some it is only one-half of the circle; in other species more, and in some less. These sutures are found also sometimes in other genera, as in the second division of the *Buccina*, but not so general in any as the *Murex*. In some species these sutures are smooth, as in *M. Tritonis*, *Vertagus*, &c.; but in more they are rough with tubercles, as in *M. Gyrinus*; some are rough with spines, as *M. Rana*; in others they extend into foliations, as *M. ramosus*.

From the number and variety of the shells which are placed in this genus, it is become almost impossible to distinguish a *Murex* from a *Buccinum* on the one hand, or from a *Strombus* on the other; so that, if Lamarck's arrangements are not adopted, still there appears to be a necessity for forming some new genera. The essential character of the *Buccinum*, *Strombus*, and *Murex*, being a canal either straight, or bending to the right, or to the left, no provision is made for those without a canal, and which have only a hollow that cannot be said to bend either way, described by Linnæus as *Ecaudati:* the consequence is, that these are divided between the *Murex* and the *Buccinum*, tending to perplex both. Also the tapering shells, which are divided among all the three genera, seem to have so great an affinity to each other, that it would render each genus much more distinct, to take these out and form them into one or two new genera, as has been done by Lamarck.

There is not much known of the animals inhabiting these shells; it is supposed they differ but little from those of the *Buccinum*; there are a few of them represented in *pl.* 11, but information on this subject is much wanted.

Linnæus makes six divisions in this genus: first, *Spinosi*; second, *Frondosi*; third, *Varicosi*; fourth, *Ecaudati*; fifth, *Caudigeri*; and sixth, *Turriti*. He describes only 61 species, Gmelin has added 102; and Dr. Burton 20. Total, 183.

Lamarck divides this genus into five, as follow:

Murex. Shell oval or oblong, with a channel at the base, having always on the outside some longitudinal ridges; generally rough with tubercles or spines, or fringed (see *Murex Haustellum*, *f.* 88).

Fusus. Shell somewhat spindle-shaped, swelling in the middle or lower part, with a channel at the base; the spire lengthened, and destitute of sutures or ridges on the outside; the pillar smooth, the right lip without a notch (see *Murex Colus*, *f.* 89).

FASCIOLARIA. Shell somewhat spindle-shaped, with a channel at the base, and without sutures, having on the pillar two or three very oblique folds (see *Murex Tulipa*, *f.* 90).

PLEUROTOMA. Shell somewhat spindle-shaped, the aperture terminating at the base in a long canal, with a notch or hollow at the upper part of the right lip (see *Murex babylonius*, *f.* 91).

CERITHIUM. Shell tapering; the aperture oblique, terminating at the base in a short canal, truncated or recurved, with a groove at the upper end of the right lip (see *Murex Aluco*, *f.* 92).

Perhaps here we may mention Lamarck's genus *Clavatula*; described as follows:

CLAVATULA. Shell somewhat turrited, rough, having the aperture terminated at the lower end by a short canal or hollow, with a notch on the right lip near the summit (see Chemn. vol. 11. t. 190. f. 1831 and 1832).

CHAPTER XXX.

OF THE *TROCHUS.* GENUS XXVII.

TROCHUS.

"**Animal a *Limax*. Shell univalve, spiral, somewhat conic; aperture somewhat four-sided, angulated or rounded, upper side transverse compressed; pillar oblique."—Linn.**

This genus is very distinct from the preceding ones, but not from the two following: the animals of this and the remaining genera have no breathing tube projecting beyond their shells; the aperture is what is called whole, *i. e.* the margin of the lip has no hollow or canal, which the seven preceding genera have, for the breathing tube to pass through.

It is by no means easy to discover the essential character of this genus: many of the species are very nearly of a conic shape, as *T. niloticus*, *maculatus*, *perspectivus*, &c.; these have the mouth somewhat angular, four-sided, or lozenge-shaped: there are also some flat or depressed *Helices*, with the mouth nearly of the same form; but the *Helices* are commonly thin semitransparent brittle shells, and the *Trochi* thick opake strong shells: others, as *T. solaris*, have a somewhat oval mouth, acute at the ends, much like *Helix Gualteriana*, *complanata*, &c.: others again vary from four-sided to half round, and some almost to quite round, as *T. sizyphinus*, *Magus*, *Pharaonis*, *Labio*, *Iris*, *muricatus*, *Modulus*, &c. The

Trochi vary as much in their general form as in the mouth: some are conic, as before mentioned; others are very depressed, as *T. perspectivus* and *solaris*; some approach the globular form, as *Labio*; many species have an irregular but conspicuous tooth near the extremity of the pillar, as *T. Pharaonis*, *Labio*, &c.; others have three or four small teeth, as *T. virgatus*; some of the last division, or *Turriti* of Linnæus, have folds on the pillar like the *Volutæ*. The *Trochi* may generally be better distinguished from the *Helices* by the texture of the shell than by the form of the mouth; but of those shells that have the mouth nearly round, it is often impossible to determine whether they are *Trochi* or *Turbines*, as among these many that have been called *Turbo* by one author are called *Trochus* by another; as for instance, the *Turbo lineatus* of Turton and Donovan is the *Trochus crassus* of Pulteney and Montagu; and many of the *Turbines* are neither perfectly round, nor yet more nearly so than some *Trochi*.

A few of the animals are described by Adanson, which differ from the common Water Snails principally in being furnished with three filaments on each side the foot, the use of which appears to be unknown; they have two very slender long horns, which they often put down to the ground as if to feel their way; the eyes are placed at the end of two short columns, one close to the root of each horn; most of them have a thin horny operculum (see *pl.* 10. *f.* 6).

Linnæus makes three divisions of this genus: first, *Umbilicati erecti*; second, *Imperforati erecti*; and third, *Turriti*.

Linnæus describes 26 species, Gmelin has added 98, and Dr. Turton 10. Total, 134.

Lamarck has divided this genus into five, as follow:

Trochus. Shell conic, with a transversely depressed and nearly quadrangular aperture, and an oblique axis (see *T. niloticus*, *pl.* 7. *f.* 93).

Solarium. Shell depressed, conical, having an open umbilicus, crenulated at the internal margin of the windings of the spire, at its base; the opening nearly quadrangular (see *T. perspectivus*, *pl.* 7. *f.* 94).

Monodonta. Shell oval or conoid; the aperture entire and roundish, with the two margins disunited at the upper part; the projecting and truncated or shortened base of the pillar forming a tooth projecting into the opening (see *T. Labio*, *pl.* 7. *f.* 95).

Phasianella*. Shell solid, ovate, or conical; the aperture longitudinal, ovate, and entire, with a sharp plain lip; the pillar smooth, with an attenuated base (see *pl.* 7. *f.* 96).

Pyramidella. Shell tapering; the aperture entire and semi-oval; the pillar projecting, with three transverse folds, and perforated at its end (see *T. dolabratus*, *pl.* 7. *f.* 97).

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* See Park. Organ. Rem. vol. 3. p. [illegible].

CHAPTER XXXI.

OF THE *TURBO*. GENUS XXVIII.

TURBO.

"Animal a *Limax*. Shell univalve, spiral, solid; aperture contracted, orbicular, entire."—LINN.

THE essential character of this genus consists in the aperture or mouth being round, and, like the *Trochus*, without any hollow or canal on the margin.

If this were strictly adhered to, and no shell placed here but what agreed perfectly with the definition, there would be no great difficulty in distinguishing this genus; but many shells are called *Turbines* by Linnæus, Gmelin, and others, the mouths of which are not exactly round. In *T. Delphinus*, *Lincina*, *petholatus*, *Chrysostomus*, and others, the mouth is round; but in *littoreus*, *personatus*, *Pullus*, and many more, it is as it were drawn or extended into an angle towards the spire, which form is also seen in several of the *Trochi*, as *Trochus Labio*, &c.: and in many *Helices*, as *Helix vivipara*, *tentaculata*, &c. *Turbo Fusus* is said by Gmelin to be lunate, from which we should expect it to be a *Helix*. *T. tridens* he describes with the aperture curved, *nautileus* with it long, *sulcatus* with it nearly square, and *helicoides* with it triangular. *T. Uva*, *bidens* (*pl.* 8. *f.* 101 and 103), and several of the small tapering species, have certainly not a round mouth, and would seem to belong rather to the *Helices* than to the *Turbines*.

The placing in this genus of shells that vary so much in the form of the mouth, has rendered it extremely difficult to distinguish a *Turbo* from a *Trochus* on the one hand, or from a *Helix* on the other. Some alteration here seems highly necessary.

Most of these shells are thick and strong, like the *Trochus*, and often pearly within; their shapes are very various: few of the animals have been described; but that inhabiting *Turbo elegans* is particularly mentioned by Montagu (p. 344 of *Testacea Britannica*), being very remarkable: it is the only land species that is known to have a testaceous operculum: it is also remarkable in having only two horns, with eyes at their base; the glossy tips of the horns are supposed also to be eyes by Montagu; and if that is correct, it will make it still more singular: they are not hermaphrodite, like the rest of the land species, but are of distinct sexes, like most of the water ones: the animals of *T. Carychium* and *Vertigo* are likewise both land species, with only two horns: it is probable, that there is much variety among the animal inhabitants of this genus; many of them have opercula, some thin and horny, others thick and testaceous.

Linnæus makes five divisions: first, *Neritoidei*; second, *Solidi imperforati*; third, *Solidi perforati*; fourth, *Cancellati*; and fifth, *Turriti*.

Linnæus describes 49 species, Gmelin has added 52, and Dr. Turton 51. Total, 152.

Lamarck divides this genus into five, as follow:

Turbo. Shell conic or slightly tapering; the aperture entire and round, and not toothed; the two lips always disjoined in the upper part (see *Turbo Cochlus, pl.* 8. *f.* 99).

Cyclostoma. Shell wheel-shaped or conical, without longitudinal ribs, the last whorl larger than the others; the aperture round, the margin circular and uninterrupted (see *T. Delphinus, pl.* 8. *f.* 98).

Scalaria. Shell tapering, with acute longitudinal raised ribs running down all the length of the spire; the aperture nearly circular, the margin uninterrupted and reflected (see *T. scalaris, pl.* 8. *f.* 100).

Turritella. Shell tapering; the aperture rounded, with the two lips disjoined in the upper part, and a notch in the right lip (see *T. Terebra, pl.* 8. *f.* 102).

Pupa. Shell cylindrical, the last turn of the spire, somewhat produced, not being larger than the preceding; the aperture irregularly roundish or oval; the margin continued circularly (see *T. Uva, pl.* 8. *f.* 101).

Mr. Parkinson observes that the genus *Cyclostoma* contains both sea and land shells, which he divides, and calls the sea shells *Delphinula*, and the land shells *Cyclostoma*.

CHAPTER XXXII.

OF THE HELIX. GENUS XXIX.

HELIX.

"**Animal a *Limax*. Shell univalve, spiral, somewhat transparent, brittle; aperture contracted, within half-moon-shaped or nearly round, with a circular segment taken away."—Linn.**

The form of the aperture in this genus is so various, that the essential character can scarcely be taken from this part; the mouth is whole, or without a hollow on the margin like the two preceding genera. The texture of the shells in almost all the species is semitransparent, which seems often to be the principal difference between the *Trochus* and *Helix*: many species have a lunated or somewhat crescent-shaped aperture, the inner lip being formed by the rounded exterior of the preceding whorl, as in *H. nemoralis, arbustorum*, &c.: others are nearly round, having but a small portion taken out of the circle by the preceding whorl, as *H. corneus* (*pl.* 8. *f.* 115), &c.: in many species of the second division, *Carinatæ*, the aperture is nearly oval, with acute ends, as in *H. complanata, Vortex*, &c.; some are angulated, like the *Trochus*, as *H. Carocolla, Gualteriana* (*f.* 116), &c.; a great many are oval, or rounded, but extended more or less into an angle toward the spire, as *H. tentaculata, solida, putris, stagnalis* (*f.* 109), &c.: the aperture in many of these is of the same form as that of many of the

Trochi, as *Labio*, *Iris*, &c.: and *Turbo*, as *littoreus*, *Pullus*, &c.

The general form of these shells is very various; many approach the shape of a globe, as *nemoralis*; some are flat and wheel-shaped, as *Vortex*; others are cylindrical, as *octona*; others depressed, much like to *Trochus solaris*, as *Carocolla*; some tapering, as *stagnalis*; and others somewhat ear-shaped, as *Auricularia*; or even flat, as *haliotoidea* (*f.* 111): in most species the mouth is without teeth; but there are many that have teeth, as *H. sinuata* (*f.* 118), &c. *H. Scarabæus* has teeth also; but is set down as doubtful by Linnæus, and seems not to have any relation to the rest of the genus.

Linnæus makes six divisions of this genus: first, *Ancipites*; second, *Carinatæ*; third, *Rotundatæ umbilicatæ*; fourth, *Rotundatæ imperforatæ*; fifth, *Turritæ*; and sixth, *Ovatæ imperforatæ*.

The animals of the land species are supposed nearly to resemble the common Garden Snails, or *Helix nemoralis* and *hortensis*; some of them are described by different authors, but many are not known. It is probable there are many varieties among the water species; *H. vivipara* and *tentaculata* have horny opercula, which is supposed not to be the case with any others of this genus.

The animal inhabiting *H. janthina* is different from all that are known of the others; it swims at liberty in the sea, and has four horns or awl-shaped tentacula; it has instead of a foot a membranous transparent lump, which it swells out at pleasure into a heap of little bladders, and which assists it in swimming.

Linnæus describes 59 species, Gmelin has added 168, and Dr. Turton 26. Total, 253.

Lamarck divides this genus into eight, as follow:

Janthina. Shell nearly globular, transparent; the aperture triangular, with an angular hollow or notch on the margin of the right lip (see *Helix janthina, pl.* 8. *f.* 107).

Bulimus. Shell oval or oblong, having the last whorl of the spire larger than the former; the aperture entire, longer than it is broad; the pillar smooth, the base entire and not spread out (see *Helix oblonga, pl.* 8. *f.* 108).

Lymnæa. Shell oblong, rather tapering; the aperture entire, longer than wide; the lower part of the right lip re-ascending and turned back into the aperture, and forming a very oblique fold on the pillar (see *Helix stagnalis, pl.* 8. *f.* 109).

Melania. Shell turrited; aperture entire, longer than wide, and spreading at the base of the pillar, which is smooth (see *Helix Amarula, pl.* 8. *f.* 117).

Ampullaria. Shell globular, ventricose, umbilicated at the base; the aperture entire and longer than wide, without any thickening on the left lip (see *Helix ampullacea, pl.* 8. *f.* 112).

Planorbis. Shell wheel-shaped; spire not projecting, flattened or sunk in; the aperture entire, longer than wide, hollowed laterally by the convex projection of the last whorl but one (see *Helix Cornu arietis*, *pl.* 8. *f.* 105).

Helix. Shell globular or orbicular, with a convex or conic spire; aperture entire, wider than long, hollowed at the upper part by the convex projection of the last turn but one (see *Helix Pomatia*, *pl.* 8. *f.* 110).

Sigaret. Shell depressed, somewhat ear-shaped; spire short, and little elevated; the aperture entire, spread out very wide, longer than wide (see *Helix haliotoidea*, *pl.* 8. *f.* 111).

The last Lamarck places with the Naked Mollusca, the shell being inclosed in the skin, like *Bulla aperta*.

Perhaps here we may place Lamarck's genera of *Helicina* and *Testacella*, as follows:

Helicina. Shell somewhat globular, no umbilicus; the aperture entire, semi-oval; the pillar thickened, compressed at the base (see List. Conch. t. 61. f. 59).

Testacella. Shell univalve, obliquely conic, the summit a little spiral; aperture oval, the left lip rolled inwards (see Favanne, 46).

CHAPTER XXXIII.

OF THE *NERITA*. GENUS XXX.

NERITA.

"Animal a *Limax*. Shell univalve, spiral, gibbous, under side flattish; aperture half round, pillar lip transverse, truncate, flattish."—Linn.

This genus is very distinct from every other. Linnæus makes three divisions in it: the first, which is named *Umbilicatæ*, is also very different from the other two; the second is imperforate without teeth; and the third imperforate with teeth.

The essential character consists in the aperture or mouth being half round (but not lunate or horned), the pillar lip being straight; many of the species are strong, thick, opake shells, especially the third division. The pillar lip in the imperforate shells of both second and third divisions is so differently constructed from that of any other genus, that these shells may be distinguished at first sight. In the umbilicated shells the form of the mouth approaches more to that of some species of *Helix*, but in most cases is sufficiently distinct from them.

There is a considerable difference in the general form of the shells of the first and third divisions, the first being nearly globular, like some *Helices*, and the third somewhat approaching to the shape of half an egg divided lengthways; the spire of these last is generally lateral and flat.

Some of the umbilicated species, as *N. Mammilla*, have the perforation or umbilicus entirely obliterated when grown to their full size; the gibbosity, which is commonly found at the umbilicus in this genus, spreading so much as entirely to cover the hole: this seems to be sometimes the case with *N. melanostoma*, and perhaps with several others.

The animals of the imperforate species are different from those of the first division, which induced Adanson to make a separate genus of them. Lamarck has adopted Adanson's genera; and as both the animals and shells are considerably different, this division seems not at all improper. The first division, or the umbilicated shells, are called by Adanson *Natica*: the head of the animal is cylindrical, the horns thick, but tapering to a fine point, with the eyes on the external side, at the base or root (*pl.* 9. *f.* 118. *a*). The imperforate shells are called *Nerita* by Adanson: the head of these animals is flat and broad; the horns cylindrical, slender, and pointed; close to each horn, on the external side, is a short triangular column, with an eye at the tip (*f.* 119. *a*). Both animals have opercula.

Linnæus describes 25 species, Gmelin has added 47, and Dr. Turton 6. Total, 78.

Lamarck has divided this genus into two, as follow:

NERITA. Shell semi-globose, flattened beneath, and having no umbilicus; the aperture entire and half round; the pillar nearly transverse, with an acute and generally dentated edge (see *Nerita polita, pl.* 9. *f.* 119).

Natica. Shell nearly globular, umbilicated, the left lip thick towards the umbilicus; the aperture entire and half round; the pillar oblique, without teeth (see *Nerita Canrena, pl.* 9. *f.* 118).

CHAPTER XXXIV.

OF THE *HALIOTIS*. GENUS XXXI.

HALIOTIS.

"Animal a *Limax*. Shell ear-shaped, spreading; spire close to the side, the disk perforated by a row of holes."—LINN.

THIS genus would be very distinct from every other, if it were not for two shells that are placed among the *Helices* by Linnæus, and which perhaps it would be better to remove; viz. *Helix haliotoidea* and *perspicua*.

The *Helix haliotoidea* should rather be placed next to the *Bulla aperta*, if the animal is at all to be attended to. *Helix perspicua* appears from its texture as well as from its form to be truly an imperforate *Haliotis*: as this appears to be the only imperforate one known to Linnæus, it is not surprising that he should hesitate about placing it with the perforated *Haliotides*, as he remarks that "the inside of the spire appears like a *Haliotis*, but it is not perforated." But now that two or three more imperforate species are known, it may with great propriety be placed in this genus.

These shells are very open and flat; they have no column or pillar, but the inside of the spire is open to the top; they do not inclose the animal, but only cover its back; the spire is very small, scarcely elevated above the other part of the shell, and placed close to one end: most of the species are very remarkable by having a spiral row of holes; as the shell increases in size new holes are formed; the last five or six are kept open, but the others are closed up by the animal: the use of these holes is not well-known, but probably they are for breathing through.

The animal inhabitant is nearly allied to that of the succeeding genus: the head is cylindrical, which they extend a very little beyond the edge of the shell, at the part furthest from the spire; they have two small slender horns, one on each side the head, with the eyes at the extremity of two short triangular columns placed a little behind the horns. They have no operculum (see *pl.* 10. *f.* 3).

Linnæus describes 7 species, Gmelin has added 12, and Dr. Turton none. Total, 19.

Lamarck has divided this genus into *two*, as follow:

STOMATIA. Shell oval or ear-shaped, with a prominent spire; the aperture large, entire, longer than wide; the disk imperforate (see *Haliotis imperforata*, *pl.* 9. *f.* 120).

HALIOTIS. Shell flattish and ear-shaped, with a depressed and nearly lateral spire, and a spiral row of holes parallel to the left edge; the aperture very large, and longer than wide, entire (see *Haliotis tuberculata*, *pl.* 9. *f.* 121).

CHAPTER XXXV.

OF THE *PATELLA.* GENUS XXXII.

PATELLA.

"Animal a *Limax.* Shell univalve, somewhat conic, without a spire."—Linn.

Linnæus makes five divisions of this genus:

1st, *Labiatæ,* 4th, *Integerrimæ,*
2nd, *Dentatæ,* And 5th, *Perforatæ.*
3d, *Mucronatæ,*

Of these the first and last are easily distinguished from the others; but the shells of the second, third, and fourth vary by such almost imperceptible degrees, that it is nearly if not quite impossible to know where to draw the line of distinction.

This genus is perhaps as well defined, and as perfectly distinct from the rest, as any one of the whole number, though consisting of a great variety of species; therefore it appears unnecessary to divide it into many, as Lamarck has done: they are all very open shells, not inclosing the animal, but covering the back only: many species are nearly conic, as *græca*; in some the point is flattened, the back being more or less rounded, but with a somewhat oval mouth, as *compressa:* others are nearly flat; some have the tip or apex near the centre, as *vulgata*; in others it is near the margin, as *Pectunculus*, &c.; in some few the tip is lengthened somewhat spirally, as *militaris* and *ungarica*; several have a small aperture at the tip (the *Perforatæ* of Linnæus), as *græca*, &c.; in many the margin is angular or wrinkled: these are the *Dentatæ* of Linnæus: as *P. octoradiata*, &c.: many have the margin crenate, with small wrinkles more or less obscure, as *ungarica*, &c. &c.: a few have the margin quite smooth, as *P. cærulea*.

Some of the first division have a horizontal partition extending about half way, as *P. fornicata*; others have a lateral partition extending from the tip to the margin nearly, as *P. chinensis*; others have only an irregular process projecting inside the tip, as *P. equestris*. All these Linnæus calls *Labiatæ*.

One or two shells that appear to be bivalves have been placed in this genus by some authors, and consequently ought to be removed: the *Patella Unguis* of Linnæus and Gmelin is the *Mytilus Rostrum* of Dr. Shaw and Turton, and the *P. anomala* of Gmelin and Turton is nearly allied to, if it is not strictly an *Anomia*: according to Lamarck, *P. sinica* is also a bivalve.

The animal of the *Patella* is somewhat like that of the *Haliotis*; it has a cylindrical head, two tapering nearly cylindrical horns, with the eyes on the external side of the base: this animal is scarcely capable of extending any part beyond the shell more than the tips of the horns.

Linnæus has described 36 species, Gmelin has added 201, and Dr. Turton 3. Total, 240.

Adanson has not altered this genus; but Lamarck has divided it into eight, as follow:

Pᴀᴛᴇʟʟᴀ. Shell oval or shield-shaped, not spiral, concave, without perforation or marginal fissure (see *P. testudinaria*, *pl.* 9. *f.* 126).

Fɪssᴜʀᴇʟʟᴀ. Shell buckler- or shield-shaped, without a spire, concave beneath, the vertex perforated with an ovate or oblong opening (see *P. græca*, *pl.* 9. *f.* 123).

Eᴍᴀʀɢɪɴᴜʟᴀ. Shell like a conical shield, the vertex inclined, and the posterior margin slit or notched (see *P. Fissura*, *pl.* 9. *f.* 127).

Cʀᴇᴘɪᴅᴜʟᴀ. Shell oval or oblong, convex above, with its apex inclined to one end, and its cavity partially interrupted by a horizontal division (see *P. fornicata*, *pl.* 9. *f.* 124).

Cᴏɴᴄʜᴏʟᴇᴘᴀs. Shell oval, convex above; the apex obliquely inclined to the left side; the interior cavity simple; with two teeth, and a hollow at the base of the right edge (see Favanne, t. 4. f. 2; Chemn. 10, p. 320. vign. A.B.)

Cᴀʟʏᴘᴛʀᴇᴀ. Shell somewhat conic, with the apex erect, entire and pointed; the cavity furnished with a convoluted lip or little tongue like a horn, isolated or extending from one side, like the blade of a knife running spirally (see *P. equestris*, *pl.* 9. *f.* 122).

Aᴄᴀʀᴅᴏ. Shell formed by two flattened and nearly equal valves; having neither hinge nor cartilage, but a muscular impression in the middle of the valves (see *P. sinica* Davila, pl. 2. f. A.; and Chemn. 10. pl. 169. f. 1645-1646.

ORBICULA. Shell orbicular, flat, fixed, composed of two valves, the lowest valve very thin and adhering to other bodies; the hinge unknown; the animal furnished with two long arms, like *Anomia Terebratula* (see *Patella anomala*, Mul. Zool. Dan. p. 14. t. 5. Prod. 2870).

Perhaps we may place here Lamarck's genus *Radiolites*, as follows:

RADIOLITES. Shell irregular, inequivalve, striate on the outside; the lower valve turbinated, the upper convex or conic; neither hinge nor cartilage (see Park. Organ. Rem. vol. 3. p. 206. t. 16. f. 1).

CHAPTER XXXVI.

OF THE *DENTALIUM*. GENUS XXXIII.

DENTALIUM.

"Animal a *Terebella*. Shell univalve, tubular, straight, one-celled, both ends pervious."—LINN.

THIS genus is very well defined, and easily distinguished from every other.

These shells are a little tapering, but nearly cylindrical, generally open at both ends, and a little bowed or bending; several species have a certain number of ribs or ridges running the whole length of the outside: these Linnæus calls angles. *D. striatulum* has eight ribs (*f.* 129), and is said to be *octangulatum*; *D. elephantinum* with ten is termed *decemangulatum*; the internal cavity is generally round.

The animal is nearly similar to some species of *Serpula*.

Linnæus has described 8 species, Gmelin has added 13, and Dr. Turton 1. Total, 22.

Lamarck has not divided this genus, but arranges it with his *VERMES*, after *Terebella*, *Amphitrite*, and some of the *Serpulæ*; and describes it as an animal contained in a testaceous solid tube, slightly arched, and open at both ends (see *Dentalium striatulum*, *pl.* 9. *f.* 129).

CHAPTER XXXVII.

OF THE *SERPULA*. GENUS XXXIV.

SERPULA.

"Animal a *Terebella*. Shell univalve, tubular, adhering, often separated internally by divisions at uncertain distances."—Linn.

These shells are not much known; there appears to be considerable variety both in the shells and also in the animals inhabiting them.

The essential character seems to be a cylindrical or rather vermiform tubular shell, often much twisted and in considerable masses, generally adhering to some other substance.

There appears to be considerable impropriety in classing such different animals together in one genus as are found in this. Some separation here seems desirable; but whether it is necessary to divide it so much as Lamarck has done, will admit of some doubt.

Linnæus has described 16 species, Gmelin has added 22, and Dr. Turton 10. Total, 48.

Lamarck has divided this genus into five, as follows:

Penicillus. Shell tubular, adhering, narrow, and rather spiral at its origin, dilating into a club form at the other end, which terminates in a convex disk beset with small tubular perforations (see S. *Penis*, *pl.* 9. *f.* 130).

VERMICULARIA. Shell tubular, turned spirally at its origin, entire through its whole length, the opening simple and round (see S. *lumbricalis*, *pl.* 9. *f.* 132).

SERPULA. A tubular, adherent, calcareous tube, variously twisted or grouped, fixed to marine bodies (see S. *glomerata*, *pl.* 9. *f.* 133).

SILIQUARIA. A tubular shell, spiral at its beginning, continued in an irregular form, being divided laterally through its whole length by a narrow slit (see S. *anguina*, *pl.* 9. *f.* 131).

SPIRORBIS. A solid testaceous tube, regularly turned spirally, wheel-shaped, adhering to marine bodies (see S. *Spirorbis*, *pl.* 9. *f.* 134).

Lamarck arranges *Serpula* and *Spirorbis* along with his VERMES.

CHAPTER XXXVIII.

OF THE *TEREDO*. GENUS XXXV.

TEREDO.

"Animal a *Terebella,* with two hemispherical calcareous valves or jaws, truncated in front, angulated beneath. Shell tapering, flexuous, penetrating wood."—Linn.

These shells are found lodged in wood lengthways with the grain, whereas the *Pholas pusilla,* which also is found buried in wood, bores its holes always across the grain. This shell bears some affinity to several of the *Serpulæ,* but the animal differs considerably from every one.

Linnæus describes only one species, the *navalis*; Gmelin has added two more; Turton has added none. Total, only 3.

Adanson classes the only *Teredo* he knew along with *Pholas pusilla.*

Lamarck divides this genus into two:

Fistulana. Shell tubular, club-shaped, open at the smaller end, containing two valves not adhering (see *Teredo Clava,* Favanne, pl. 5. f. N).

Teredo. Shell tubular, cylindrical, open at both ends; the lower furnished with two lozenge-shaped valves, and the upper end with two opercula (see *Teredo navalis,* Adans. *Sénégal,* t. 19. f. 1.; and Sellii *Tered.* t. 1).

A GLOSSARY

OF

LATIN TERMS

FREQUENTLY USED IN CONCHOLOGY.

Abbreviatus, having the last whorl shortened.

Abruptus, as if broken or cut off.

Acicularis, needle-shaped.

Aculeatus, prickly.

Aculei, prickles.

Acuminatus, tapering to a point.

Acutus, sharp.

Adnatus, growing close to.

Adpressus, pressed close together.

Adscendens, ascending.

Æqualis, equal.

Æquilateralis, when the shell on each side of the hinge is equal in size and figure.

Æquivalvis, when both valves are equally convex.

Alatus, winged.

Albidus, whitish.

Alternus, every other, every second one.

Ambitus, the circumference or outline of the whole shell.

Amplexus, embraced.

Amplus, large.

Anceps is expressive of a longitudinal suture or keel at the side of the shell, as *Helix Scarabæus*.

Anfractus, a whorl.

Angularis, } angular.
Angulatus, }

Angustior, more narrow.

Angustissimus, very narrow.

Angustus, narrow.

Anomalus, without order, irregular.

Anticus applies to the fore part.

Antiquatus is applied when bivalve shells are transversely grooved, and appear as if young shells were placed on them at the apex.

Antrorsùm, forward, towards the fore part.

Anus, a depression on the posterior side near the hinge of some bivalves.

Apertura, the opening of a univalve shell.

Apex, the point or summit of the spire.

Approximatus, near together, approaching.

Arcuatus, bowed, bent like a bow.

Armatus, armed.

Articulatus, jointed.

Asper, rough.

Attenuatus, very thin, slender.

Auricula, a little ear, the outside of the ear.

Auriculatus, eared, having little ears.

Auriformis, ear-shaped.

Auris, an ear.

Auritus, having ears.

Barbatus, bearded, with stiff hairs on the surface of the shell.

Basis, the base, the end of the shell furthest from the spire, and the nates or beaks of bivalves.

Bicornis, with two horns.

Bifidus, with a line or groove double or divided into two.

Bimarginatus, with a double margin.

Bivalvis Testa, a shell composed of two pieces connected by a hinge.

Brevis, short.

Brunneus, brown.

Bullatus, blistered.

Cæruleus, blue.

Cæspitosus, matted together.

Calcar, a spur.

Calyptra, a veil.

Canaliculatus, channelled.

Cancellatus, with ribs or grooves across the whorls.

Capitatus, with a head.

Cardinalis, belonging to a hinge, the chief.

Cardo, the hinge.

Carina, a keel.

Carinatus, keeled; applied to shells the whorls of which have a sharp edge, as *Helix carinata*.

Cariosus, as if decayed or worm-eaten.

Carneus, fleshy.

Carnosus, full of flesh.

Cartilagineus, gristly.

Cassis, a helmet.

Castaneus, like a chesnut.

Castrensis, like a camp.

Catenatus, chained.

Catenulatus, chained with a little chain.

Cauda, the base of the aperture extended like a tail.

Caudatus, elongated, with a tail.

Ciliatus, fringed.

Cilium, a fringe.

Cinctus, a band or girdle.

Cinereus, ash-coloured.

Cingulum, a girdle or band.

Clava, a club.

Clavatus, club-shaped.

Clausus, closed, shut.

Coarctatus, having the aperture without a hollow behind; contracted, drawn together; opposed to *Effusus*.
Cochlea, a univalve shell.
Cochleatus, like a snail's shell.
Columella, a column, the centre pillar or axis of the spiral shells.
Complicatus, folded up, wrapt together.
Compressus, applied to bivalves that are but a little convex.
Concameratus, chambered, arched.
Concatenatus, chained together.
Concavus, concave.
Concha, a bivalve shell.
Confertus, crowded.
Conicus, conical.
Connivens, approaching, converging.
Contortus, twisted.
Convexus, when the valves are considerably convex.
Convolutus, rolled up; with one end enveloped, the other conspicuous.
Cordatus, like a heart.
Cordiformis, shaped like a heart.
Coriaceus, like leather.
Corniformis, horn-shaped.
Cornutus, horned.
Coronatus, crowned with a circle of raised knobs or points round the spire.
Corticatus, having a rind or bark.
Costæ, ribs.
Costatus, ribbed.
Crassiusculus, thickish, rather thick.
Crassus, thick.
Crenatus, scolloped or notched.
Crispus, curled or bent waving.
Cristatus, crested.
Crusta, the shell of a Lobster or Crab, &c.
Cucullatus, hooded.
Cuneiformis, wedge-shaped.
Cuspidatus, with a point like a spear.
Cylindraceus, like a roller or cylinder.

Decollatus, with the top or apex as if broken or cut off.
Decurrens, running down.
Decussatus, with longitudinal and transverse ridges or hollows crossing each other.
Deflexus, bent downwards.
Dehiscens, gaping, opening wide.
Densus, thick, close.
Dens, a tooth.
Dentatus, toothed.
Denticulatus, with little teeth.
Deorsùm, downward.
Depressus, depressed.
Desinens, coming to an end.
Dextrorsùm, on the right side.
Didymus, double.
Diffusus, spreading.
Digestus, set in order.
Digitatus, having the outer lip divided into lobes, or fingered.
Dilatatus, extended, stretched out.
Dimidiatus, divided into two parts.
Discus, the centre or middle part of each valve.
Disjunctus, disjoined.
Dissectus, cut or divided.
Dissepimentum, a thin partition like a skin.
Distortus, mis-shapen.
Divaricatus, spreading wide asunder.

Divergens, tending to various parts from one point.
Dorsum, the back, the upper surface when the shell is laid on the aperture.
Duplicatus, doubled.

Ecaudatus, without a tail.
Echinatus, beset with prickles.
Edentulus, without teeth.
Effusus, opposed to *Coarctatus*, having the lips separated by a hollow groove ending like a spout formed to pour out.
Elongatus, lengthened.
Emarginatus, having the margin with a hollow groove.
Eminens, standing up.
Ensiformis, sword-shaped.
Epidermis, the outward thin skin.
Erectus, upright.
Erosus, gnawed.
Exaratus, defaced, furrowed.
Exasperatus, sharpened.
Excavatus, hollowed.
Excurrens, running out.
Exoletus, as if worn out or obliterated.
Explanatus, spread out wide.
Exquisitus, fine.
Exsertus, thrust out.
Externus, outward.
Extimus, the last.
Extus, without.
Exumbilicatus, without an umbilicus.

Faba, a bean.
Fascia, a band.
Fasciatus, banded.
Fasciculatus, having little bands.
Fasciculus, a little band.
Fastigiatus, in bundles.
Faux, the mouth or throat.
Ferrugineus, of a rusty iron colour.
Filiformis, thread-shaped.
Fimbriatus, fringed.
Fimbricatus, tattered.
Fissum, a cleft or notch in the fore part of the lip, as in *Murex Babylonius*.
Fissus, cloven.
Fistulosus, hollow.
Flavescens, yellowish.
Flexuosus, zigzag, bending, waved.
Foliaceus, leafy.
Foramen, a hole.
Fornicatus, arched or hollowed.
Fornix, an arch, cavity, or vault.
Fossula, a little hollow or pit.
Foveola, a little hollow which receives a tooth of the opposite valve.
Frondosus, having branches extending from the ridges that cross the whorls of some of the *Murices*.
Fragilis, brittle.
Fuscus, brown.
Fusiformis, spindle-shaped, swelled in the middle, gradually tapering to each end.

Galea, a helmet.
Geminatus, double.
Geniculum, the knee joint.
Gibbus, hunched, swelling out.
Glaber, bright, smooth, bare.
Glaberrimus, very bright or smooth.
Globosus, globular.
Granulatus, beaded.

Hians, gaping, opening.

Hirsutus, hairy, bristly.

Hispidus, covered with strong hair.

Imbricatus, tiled, laying over one another like the tiles of a house.

Imperforatus, unpierced, having no holes.

Incarnatus, flesh-coloured.

Incisus, notched.

Incrassatus, made thick.

Incumbens, lying down or upon.

Incurvatus, curved inwards.

Indistinctus, indistinct, confused.

Indivisus, undivided, uncloven.

Inæqualis, unequal.

Inæquilateralis, unequal-sided, applied to a shell having one side of the beak not equally curved with the other.

Inæquivalvis, unequally valved, applied to shells having one valve flatter than the other.

Inermis, unarmed, weak.

Inferus, inferior, lower.

Inflatus, swoln.

Inflexus, bent inwards.

Infundibuliformis, funnel-shaped.

Insertus, thrust in.

Integer, entire, whole, not cut or hollowed.

Integerrimus, very entire.

Interjectus, placed between.

Intertextus, interwoven.

Intestinum, the inward part.

Introrsùs, within.

Intrusus, thrust in.

Intùs, within.

Invicèm, in turns.

Involutus, with the outer lip rolled inwards.

Labiatus, having lips.

Labium, or *Labrum*, the lip, or the margin of the aperture.

Laciniatus, jagged.

Lacunosus, pitted with hollow grooves.

Lacustris, belonging to a lake.

Lævis, smooth.

Lævigatus, made smooth, as if washed.

Læviusculus, smoothish.

Lamellatus, with thin plates.

Lanatus, cobwebbed, woolly.

Lanceolatus, spear-shaped.

Lateralis, belonging to a side.

Latitudo, breadth.

Latus, broad.

Latus, a side.

Legumen, a pod resembling that of a pea.

Lenticularis, like a lentil.

Lentiformis, lentil-shaped.

Limbus, a border.

Linea, a coloured line.

Linearis, strap-shaped.

Lineatus, marked with coloured lines.

Linguæformis, tongue-shaped.

Litteratus, with marks like letters.

Lividus, pale.

Lobatus, divided into lobes.

Longior, longer.

Longitudinalis, lengthwise from the base to the apex in univalves, or radiating from the beak to the margin in bivalves.

Lucidus, bright.

Lunatus, crescent-shaped.

Lunulæ, little moons.

Lutescens, of a dirty clay colour.
Lyratus, lyre-shaped.

Macula, a spot.
Major, larger, greater.
Margaritaceus, pearly.
Marginatus, with a thickened margin.
Margo, the margin or edge.
Membranaceus, skinny, like parchment.
Modicè, moderately.
Moniliformis, like a necklace.
Mucronatus, dagger-pointed.
Muricatus, with sharp points.
Mutilatus, cut off.

Nates, the beaks of bivalves near the hinge.
Navicularis, boat-shaped.
Nebulosus, cloudy.
Nitidus, shining, glittering.
Nodosus, knotty.
Notatus, marked.

Obductus, spread out.
Obliquus, slant, oblique.
Obliteratus, what can scarcely be perceived.
Oblongus, oblong, longer than oval, and approaching a long square.
Obovatus, about egg-shaped.
Obsitus, covered all over.
Obsoletus, worn out, indistinct.
Obtectus, covered.
Obtusus, blunt or obtuse.
Ocellus, a little eye.
Ochroleuca, brimstone colour.
Oculus, an eye.
Opacus, opake.
Operculum, a lid or door, a small piece of shell with which some univalves close the aperture of their shells.
Operculatus, having a little lid or door.
Orbicularis, globular.
Ovalis, oval, having the two ends equal.
Ovatus, egg-shaped.

Pallidus, pale.
Palmatus, hand-shaped.
Palustris, belonging to a lake.
Papillosus, pimpled.
Parallelus, parallel.
Parùm, but a little.
Parvus, small.
Patens, expanding, opening.
Patulus, open.
Paulò, a little, somewhat.
Paululùm, very little.
Pectinatus, with ribs or ridges longitudinal, or radiating from the beak to the margin.
Pellucidus, transparent.
Peltatus, shaped like a shield or target.
Perforatus, with a hole.
Pertusus, bored or deeply hollowed.
Pictus, painted.
Pili, hairs.
Pilosus, hairy.
Planus, flat.
Planiusculus, flattish.
Plicatus, folded, plaited.
Plumosus, feathery.
Pollex, the thumb.
Pollex, an inch.
Ponè, behind.
Porrectus, extended, stretched out.

Posticus, behind, used to express the back part.

Prætenuis, very thin.

Primarius, the chief.

Productus, produced, extended.

Profundus, deep.

Prominens, prominent, standing out.

Prominulus, rather prominent.

Propinquus, near.

Pubes, down.

Pubescens, downy.

Punctatus, dotted.

Punctus, a point, a prick.

Purpurascens, purplish.

Pyriformis, shaped like a pear.

Quadratus, four-sided.

Radiatus, with lines like rays diverging from a centre.

Radii, rays.

Ramosus, branching.

Recurvatus, turned backwards.

Recurvus, hooked, curved back.

Rectus, straight.

Reflexus, bent back.

Remotus, distant.

Reniformis, kidney-shaped.

Repandus, bowed or bent back, broad or flat.

Resupinatus, lying on its back, or turned upwards.

Reticulatus, reticulated, as if covered with network.

Retractus, drawn back.

Retrorsum, backward.

Retusus, blunt.

Revolutus, rolled back.

Rhombus, used to express a diamond or lozenge shape.

Rigidus, stiff.

Rima, a chink, a cleft, in bivalves, where the connecting cartilage is fixed.

Ringens, gaping.

Roseus, rosy, rose-coloured.

Rostratus, having a beak; in bivalves, having the fore part long and narrow: *Tellina rostrata*.

Rostrum, a beak; where the extremity or base is drawn out to a long point, in univalves.

Rotatus, wheel-shaped.

Rotundatus, rounded.

Rubicundus, very red.

Rudis, rough, coarse, as if unfinished.

Rufescens, reddish.

Ruga, a wrinkle.

Rugosus, wrinkled.

Rupes, a rock.

Saxum, a stone, a rock.

Scaber, rough, rugged.

Scandens, climbing.

Scriptus, marked with various characters like writing.

Scrobiculatus, furrowed with irregular seams.

Scrobiculus, a hollow at the hinge that receives a tooth or cartilage.

Scutellum, a shield.

Serratus, like the teeth of a saw.

Sericeus, silky.

Setaceus, bristly.

Setosus, hairy.

Sinister, applied to those shells which turn to the left, the same way as the sun.

Sinistrà, on the left side.

Sinuatus, indented.
Sinus, a hollow.
Sipho, a pipe.
Solutus, separated.
Sparsus, sprinkled.
Spina, a spine.
Spinosus, spinous, thorny.
Spira, a spire, that end of the shell where the turns are perceived.
Spiralis, spiral.
Squama, a scale.
Squamatus, scaly, covered with scales.
Squamosus, scaly.
Squamula, a little scale.
Stellatus, marked with spots like stars.
Stria, a line raised or hollowed.
Striatus, marked with small hollowed lines.
Strigosus, thin, slender.
Sub, nearly, almost, or somewhat.
Subulatus, awl-shaped.
Succinctus, surrounded.
Sulcatus, with broad grooves or ridges.
Superficies, the surface.
Sutura, a seam or joining where the whorls unite.

Tectus, covered.
Tenuis, thin.
Teres, tapering like a horn, as *Dentalium*.
Terminalis, ending.
Ternatus, threefold.
Tessellatus, marked like chequers.
Testa, a shell.
Testaceus, shelly.
Tetragonus, with four corners.
Tomentosus, downy.
Torulus, a little rope or wreathed band.
Transversus, crosswise or parallel to the margin in bivalves, and spiral or across the shell in univalves.
Trapeziformis, irregularly four-sided.
Tricuspidatus, with three points.
Trigonus, three-cornered.
Triqueter, triangular, three-sided.
Truncatus, lopped, as if something was cut off.
Tuberculatus, with small tubercles or pimples.
Tubulosus, tubular.
Tumidus, swelled.
Turbinatus, shaped like a top, broad above and small beneath.
Turgidus, swelled, bumping.
Turritus, when the whorls of the spire are drawn out in a conic form, making the shell much longer than broad.

Valva, a valve, one of the pieces of a bivalve shell.
Valvula, a little valve, one of the pieces of a bivalve shell.
Varicosus, with swelled veins or sutures.
Variegatus, variegated, of several colours.
Varix, a swelling vein or joining across the whorls of univalve shells.
Venter, the belly or last whorl of the shell.
Ventricosus, distended.
Ventriculosus, with a little belly.

Ventriculus, a little bellying or swelling out.

Verrucosus, full of warts, rough, uneven.

Vertex, the point or upper part of the patella.

Vesicularis, having a little bladder.

Vexillum, a standard.

Violaceus, of a violet colour.

Virgatus, streaked.

Viridis, green.

Ulva, a sea-weed.

Umbilicatus, having a hollow column or umbilicus.

Umbilicus, the hole at the bottom of the pillar.

Umbo, the beak or point of bivalves near the hinge.

Uncinatus, hooked, armed with hooks or claws.

Undatus, waved.

Unguis, a nail or claw.

Unilocularis, one-celled.

Utriculus, a little bladder.

Utrinque, on both sides.

Uva, a grape.

A LIST

OF THE

ENGLISH NAMES OF SHELLS,

WITH THE

LINNÆAN GENERA AND SPECIES.

English Name.	Genera and Species.
Acorn Shell	Lepas
Admiral	Conus Ammiralis
Admiral Orange	Conus arausiacus
Agate	Conus Rusticus
Agate Snail	Bulla achatina
Almond	Bulla Ampulla
Alphabet	Conus litteratus
American Clam	Venus mercenaria
Argus	Cypræa Argus
Argus lesser	Cypræa cribraria
Ass's Ear	Haliotis asinium
Badger	Buccinum Males
Banded Moor	Murex Morio
Barnacle	Lepas
Bat	Voluta Vespertilio
Bear's Paw	Chama Hippopus
Bezoar	Buccinum glaucum
Birchwood	Conus betulinus
Bishop	Voluta episcopalis
Black-eyed Cowry	Cypræa ocellata
Black Tiger	Conus marmoreus
Black Mitre	Helix Amarula
Bleeding Tooth Nerite	Nerita grossa and Peloronta
Boat	Patella compressa and fornicata
Borer	Pholas
Bronze Limpet	Patella Lepas
Bull's Mouth	Buccinum rufum
Butterfly	Conus genuanus
Button	Trochus vestiarius
Camp Olive	Voluta porphyria
Camp Shell	Venus castrensis
Cardinal	Voluta Cardinalis
Carrier	Trochus conchyliophorus
Cat's Foot Cat's Paw	Ostrea Pes felis
Cat's Tongue	Tellina Lingua felis
Cedo nulli	Conus Ammiralis
Chain Admiral	Conus Mercator
China Hat	Patella chinensis
Chinese Umbrella	Patella Umbella
Club	Murex Vertagus and Aluco
Cockchafer	Helix Scarabæus
Cockscomb Oyster	Mytilus Crista galli
Common Oyster	Ostrea edulis
Common Cockle	Cardium edule
Common Muscle	Mytilus edulis
Conch	Buccinum tuberosum and Strombus Gigas
Cowry	Cypræa
Cowry common	Cypræa Moneta

English Name.	Genera and Species.
Currycomb	Solen strigilatus
Date	Voluta Persicula, Voluta glabella, Voluta Dactylus
Devil	Murex Turbinellus
Devil's Claw	Strombus Chiragra
Diana's Ear	Strombus Auris Dianæ
Distaff	Murex Colus
Dolphin	Turbo Delphinus
Ducal Mantle	Ostrea Pallium and Radula
Duck Barnacle	Lepas anatifera
Duck's Foot	Ostrea nodosa
Eatable Snail	Helix Pomatia
Ebony Ladle	Strombus ater
Egg	Cardium serratum
Ethiopian Crown	Voluta æthiopica
Fallow Deer	Cypræa Vitellus
False Wentletrap	Turbo Clathrus
Fan	Ostrea opercularis
Fig	Bulla Ficus Murex perversus
Flambeau	Conus Generalis
Flounder	Ostrea Pleuronectes
Flyspot	Conus Stercus muscarum
Foolscap Great	Patella ungarica
Foolscap Limpet	Patella stultorum
Footman	Murex Rubecula
Fox	Voluta Vulpecula
French Horn	Turbo Oculus capri
Frog	Murex Rana and Scrobiculator
Garden Snail	Helix hortensis and nemoralis
Giant Cockle	Chama Gigas
Giant Oyster	Mytilus Hyotis
Gold Mouth	Turbo Chrysostomus
Great Conch	Strombus Gigas
Great Sailor	Nautilus Pompilius
Great Tooth Cowry	Cypræa caurica
Green Muscle	Mytilus viridis and ungulatus
Green Peas	Nerita viridis
Groom	Conus Capitaneus
Guinea Fowl	Nerita virginea
Hail Storm	Cypræa procellaria
Hammer Oyster	Ostrea Malleus
Harp	Buccinum Harpa
Heart	Chama Cor
Hebrew Cone	Conus ebraicus
Helmet	Buccinum tuberosum, cornutum, flammeum
Hercules' Club	Murex Aluco
High Admiral	Conus Ammiralis
Hinged Oyster	Spondylus Gædaropus
Horned Snipe	Murex cornutus
Horn of Plenty	Ostrea Cornucopia Serpula Cornucopia
Horse Chesnut	Murex Hippocastanum
Hottentot	Voluta caffra
Hound's Ear	Ostrea Isogonum
Huntsman	Conus Capitaneus
Iris	Haliotis Iris
Iron Mould	Cypræa stolida
Judas's Ear	Voluta Auris Judæ
Knife Handle	Solen Cultellus
Knobby Ladle	Strombus lividus
Lapwing's Egg	Bulla Ampulla and Cypræa Venelli
Leopard	Conus litteratus
Lime	Cypræa Cicercula
Limpet	Patella
Louse	Cypræa Pediculus
Lynx	Cypræa Lynx
Magpie	Turbo Pica
Mainsail	Strombus Epidromis
Mangrove Oyster	Ostrea parasitica
Map Cowry	Cypræa Mappa
Marble Cone	Conus marmoreus
Medusa's Head	Patella tuberculata
Melon	Voluta Olla
Melon clouded	Voluta Cymbium

English Name.	Genera and Species.
Midas's Ear	Haliotis Midæ Voluta Auris Midæ
Military Horn	Helix Cornu militare
Millepede	Strombus Millepeda
Mitre	Voluta papalis, episcopalis, and Cardinalis
Mole	Cypræa testudinaria
Money	Cypræa Moneta
Monk	Conus Monachus
Moor	Murex Morio
Mother of Pearl	Mya margaritifera Mytilus margaritiferus
Mouse	Cypræa Mus
Music Shell	Voluta musica
Muscle	Mytilus edulis
Needles	Buccinum lanceatum, dimidiatum, duplicatum, subulatum, &c.
Netted Thimble	Voluta reticulata
Noah's Ark	Arca Noæ
Nutmeg	Cypræa arabica
Old Woman	Murex Anus
Olive	Voluta Oliva Ispidula Utriculus
Orange Admiral	Conus arausiacus
Orange Flag	Voluta Vexillum
Oyster	Ostrea edulis
Pagoda	Turbo Pagodus
Painted Muscle	Mytilus pictus
Painted Pigeon	Strombus gibberulus
Painter's Muscle	Mya pictorum
Panther	Cypræa pantherina
Paper Roll	Bulla Terebellum
Paper Nautilus Paper Sailor	Argonauta Argo
Partridge	Buccinum Perdix Strombus Canarium
Partridge Cockle	Cardium medium
Pear	Voluta Pyrum
Pearl Muscle	Mya margaritifera
Peaspod	Solen Legumen
Pelican's Foot	Strombus Pes pelicani

English Name.	Genera and Species.
Periwinkle	Turbo littoreus
Persian Robe	Murex Trapezium
Persian Scoop	Buccinum persicum
Pickaxe	Ostrea Malleus
Pigeon's Egg	Bulla Naucum
Pig's Snout	Murex Femorale
Pilgrim's Scallop	Ostrea jacobæa
Plough	Strombus Gallus
Poached Egg	Bulla Ovum
Pomegranate	Turbo sarmaticus
Pope	Voluta papalis
Porcupine	Murex Ricinus
Prince of Orange Flag	Bulla virginea
Purple Muscle	Mytilus bidens
Ram's Horn	Helix Cornu arietis
Rasp	Tellina scobinata Cardium Isocardia Ostrea Lima
Razor Shell	Solen Siliqua and Vagina
Ribband	Strombus vittatus
Ribband Snail	Bulla virginea
Ring Cowry	Cypræa Annulus
Roll of Paper	Bulla Terebellum
Rose Bud	Bulla Amplustra
Royal Mantle	Ostrea Pallium
Rugged Trumpet	Murex Lampas
Saddle	Anomia Sella
Sailor Great	Nautilus Pompilius
Sailer Paper	Argonauta Argo
Scallop common	Ostrea maxima
Scoop	Buccinum Hæmastoma
Scoop Persian	Buccinum persicum
Scoop Wide Mouth	Buccinum patulum
Scorpion	Strombus Scorpio
Sea Ear	Haliotis
Serpent's Head	Cypræa Caput serpentis
Sheath	Solen Vagina and Siliqua
Ship Worm	Teredo navalis
Shuttle	Bulla Volva
Silver Mouth	Turbo argyrostomus

English Name.	Genera and Species.
Snail	Helix
Snake's Head	Cypræa Caputserpentis
Sole Oyster	Mya Vulsella
Spider	Strombus Chiragra
Spider's Web	Conus arachnoideus
Spindle	Murex Colus Strombus Fusus
Staircase	Trochus perspectivus
Star Cowry	Cypræa Helvola
St. James's Scallop	Ostrea jacobæa
Stone Eater	Mytilus lithophagus
Strawberry	Cardium Unedo
Sun Trochus	Trochus Solarium
Swallow	Mytilus Hirundo
Scymiter	Solen Ensis
Telescope	Trochus Telescopium
Thorny Heart	Chama Arcinella
Thorny Snipe	Murex Brandaris
Thorny Woodcock	Murex Tribulus
Tiger Cowry	Cypræa tigrina
Tiger Black	Conus marmoreus
Tiger Cat	Conus Princeps
Tiger Yellow	Conus nobilis
Tooth Shell	Dentalium
Tortoise	Patella testudinaria
Tower of Babylon	Murex babylonius
Tree Oyster	Mytilus Frons Mytilus Crista galli
Trumpet	Murex Tritonis
Tulip	Tellina radiata Conus Tulipa Murex Tulipa
Tulip Muscle	Mytilus Modiolus
Tun	Buccinum Galea
Tun clouded	Buccinum Olearium
Tun Partridge	Buccinum Perdix
Turban	Trochus luber
Turnips	Bulla Rapa
Twisted Ark	Arca tortuosa
Two Spot Cowry	Cypræa erosa
Venus's Heart	Cardium Cardissa
Violet Snail	Helix janthina
Umbrella	Patella Umbella
Wampum	Venus mercenaria
Wasp	Cypræa Asellus
Water Pot	Serpula Penis
Wax Taper	Conus Virgo
Weaver's Shuttle	Bulla Volva
Wedge	Donax
Wentletrap False	Turbo Clathrus
Wentletrap	Turbo scalaris
Whelk	Buccinum undatum
Wing	Pinna
Woodcock	Murex Haustellum
Woolspinner	Mytilus discors
Wreath	Turbo
Yolk of Egg	Nerita Vitellus
Zebra	Bulla Zebra Cypræa Zebra
Zigzag	Cypræa Ziczac Ostrea Ziczac

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Plate 1.

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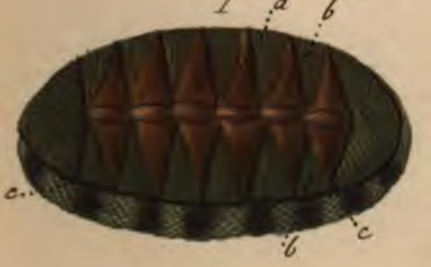

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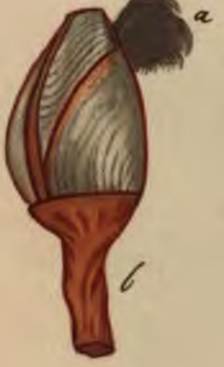

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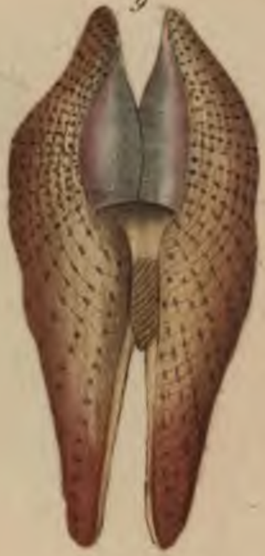

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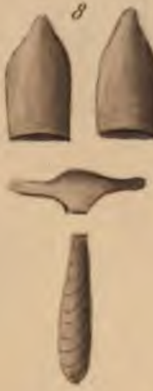

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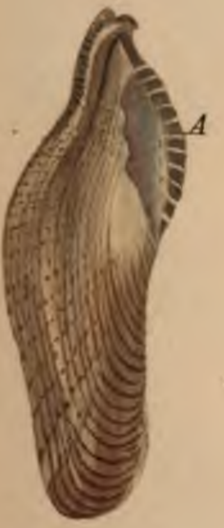

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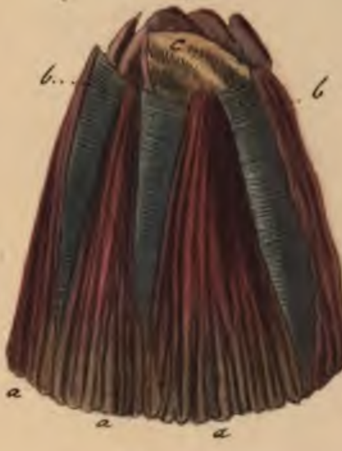

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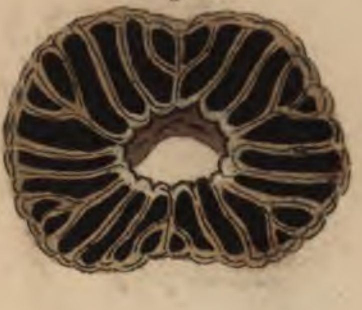

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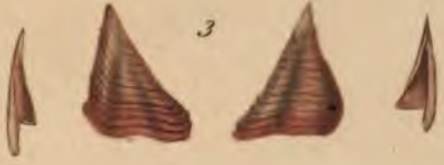

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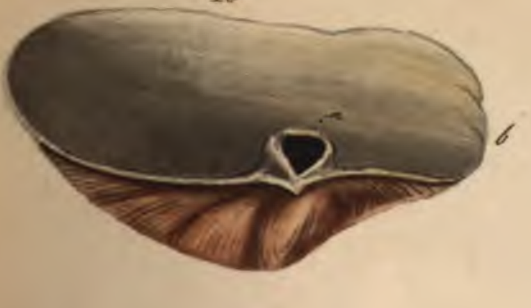

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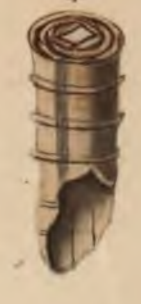

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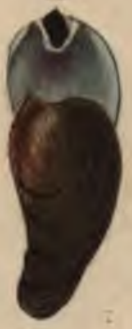

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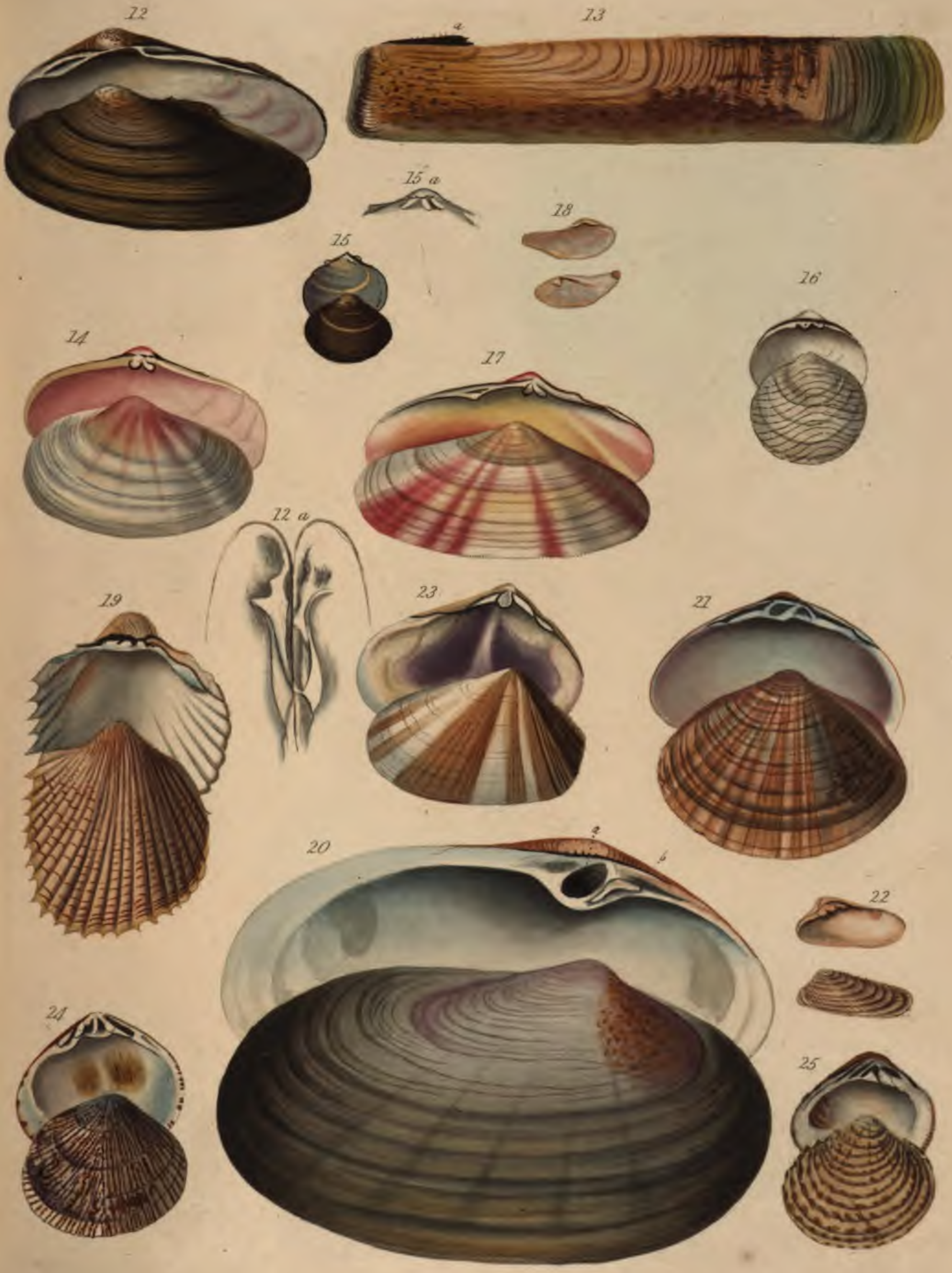
Plate 2.



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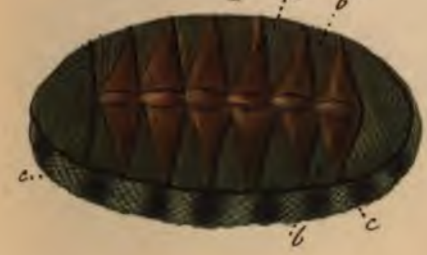

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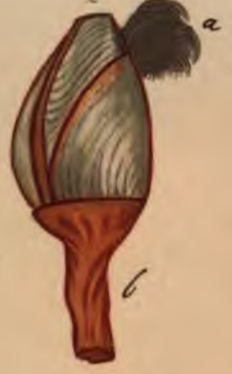

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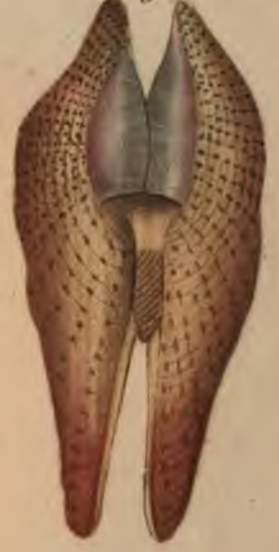

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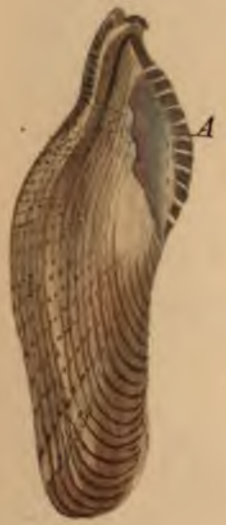

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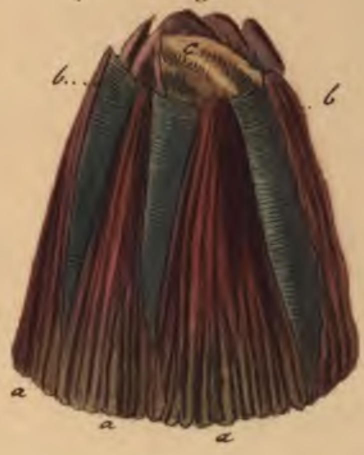

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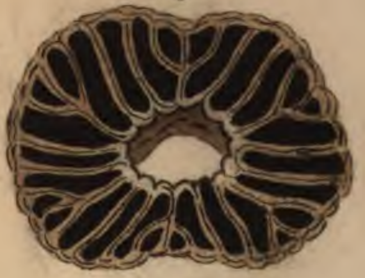

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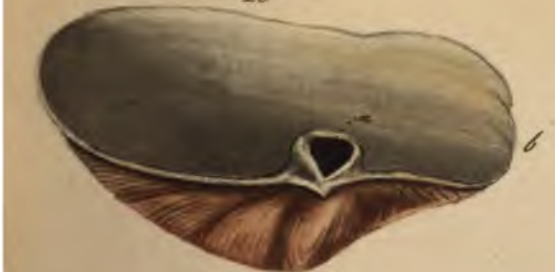

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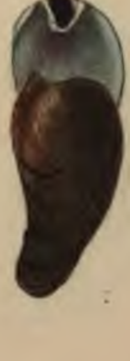

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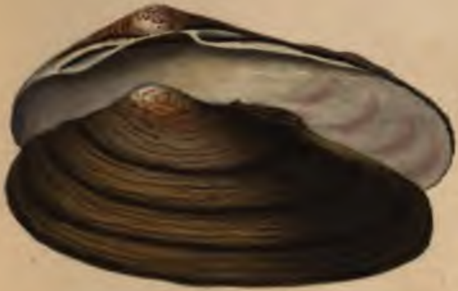

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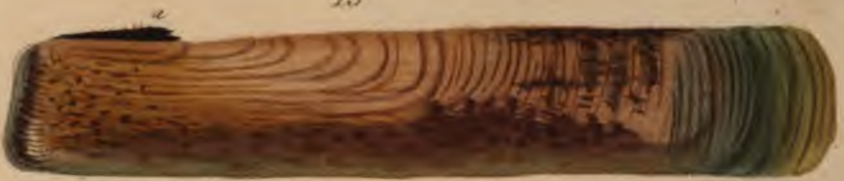

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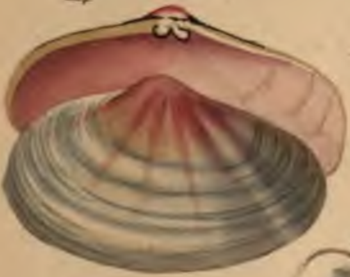

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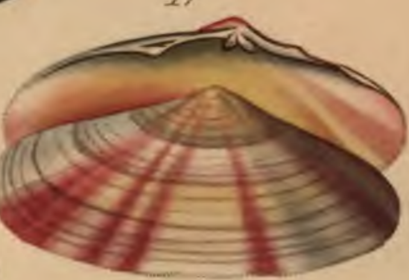

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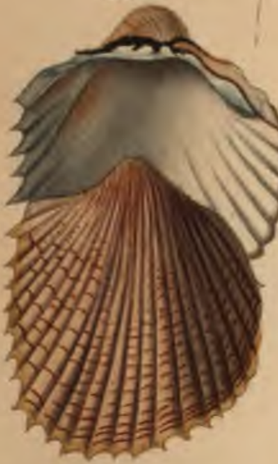

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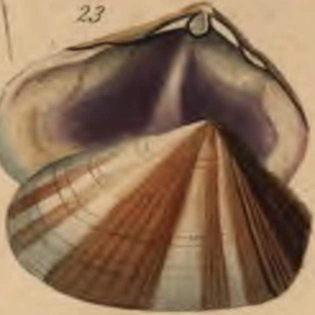

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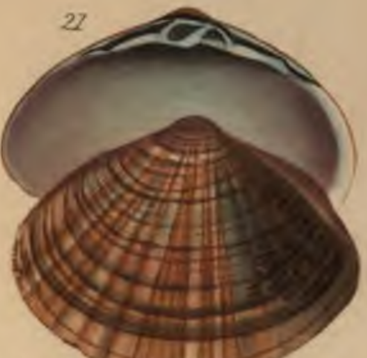

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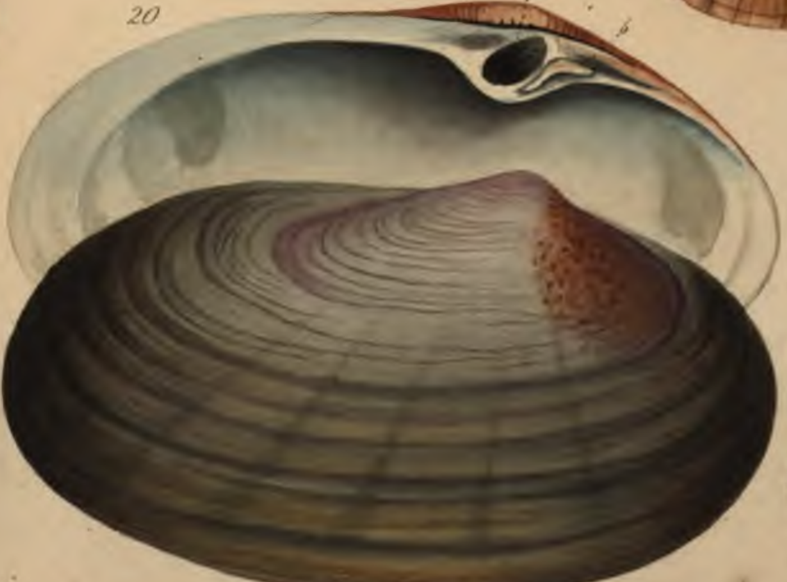

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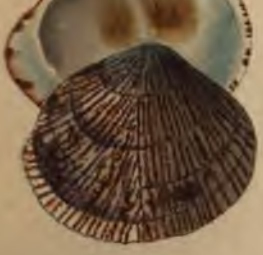

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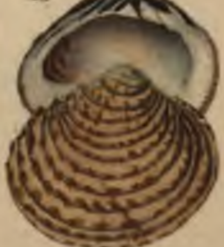

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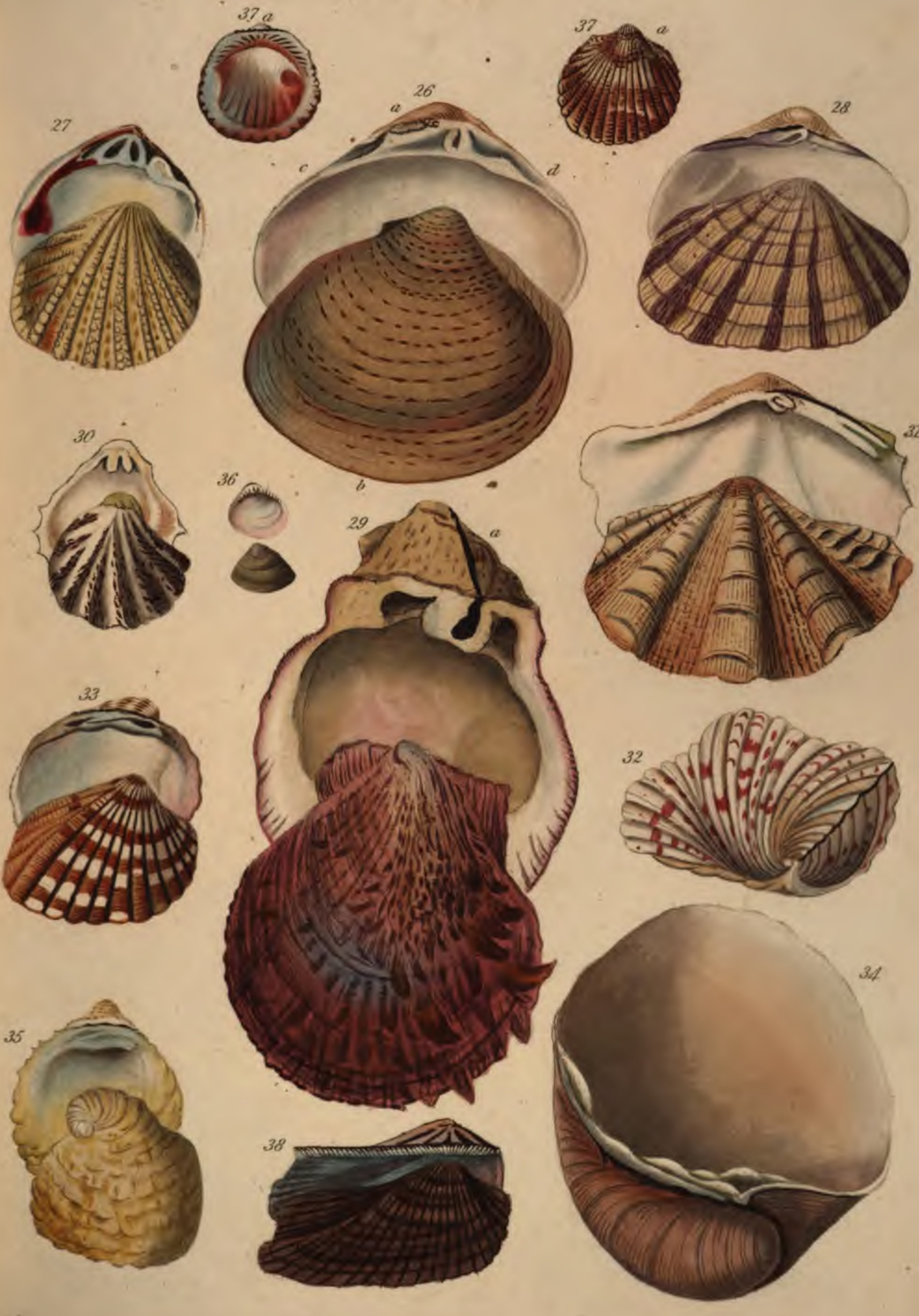

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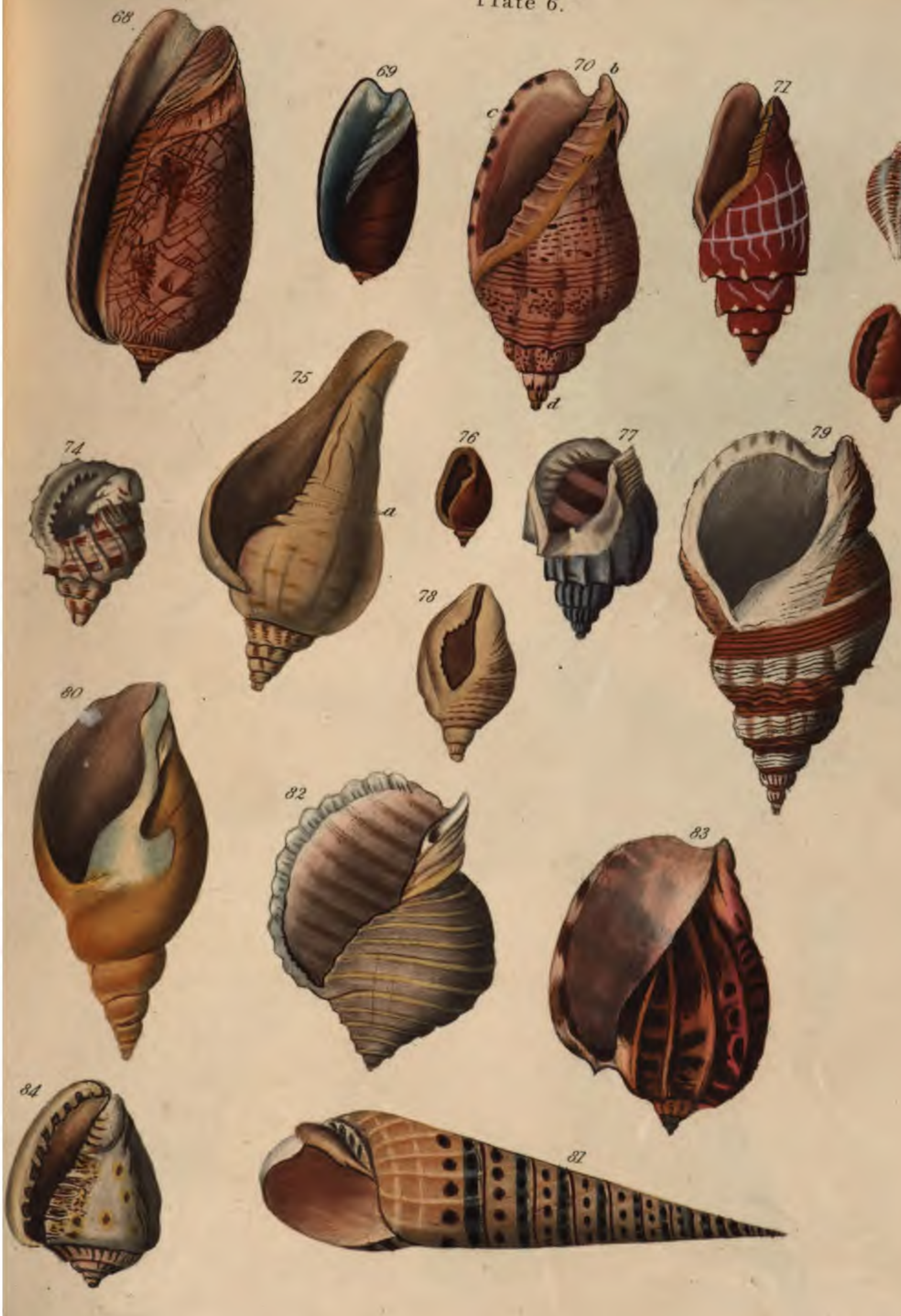

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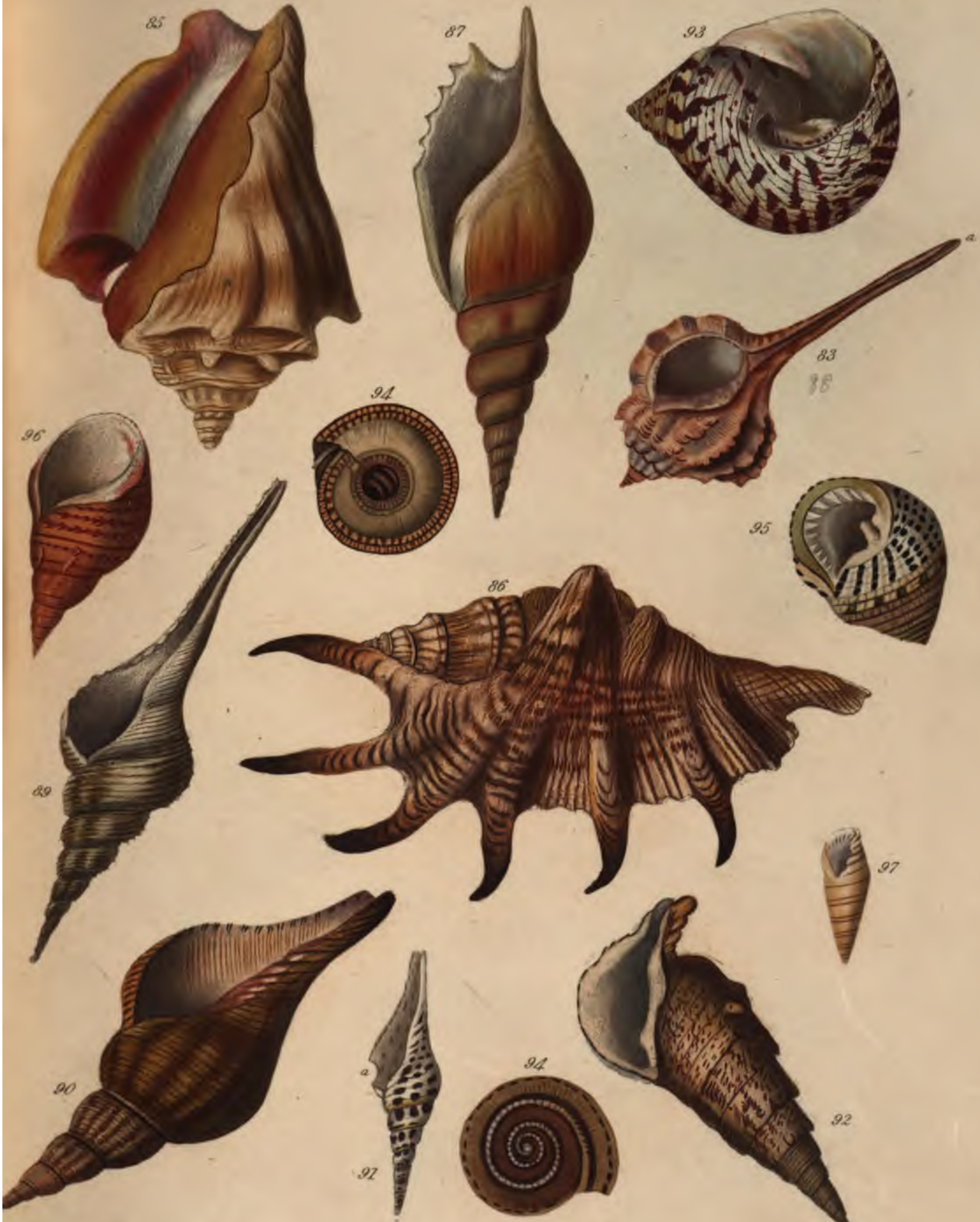

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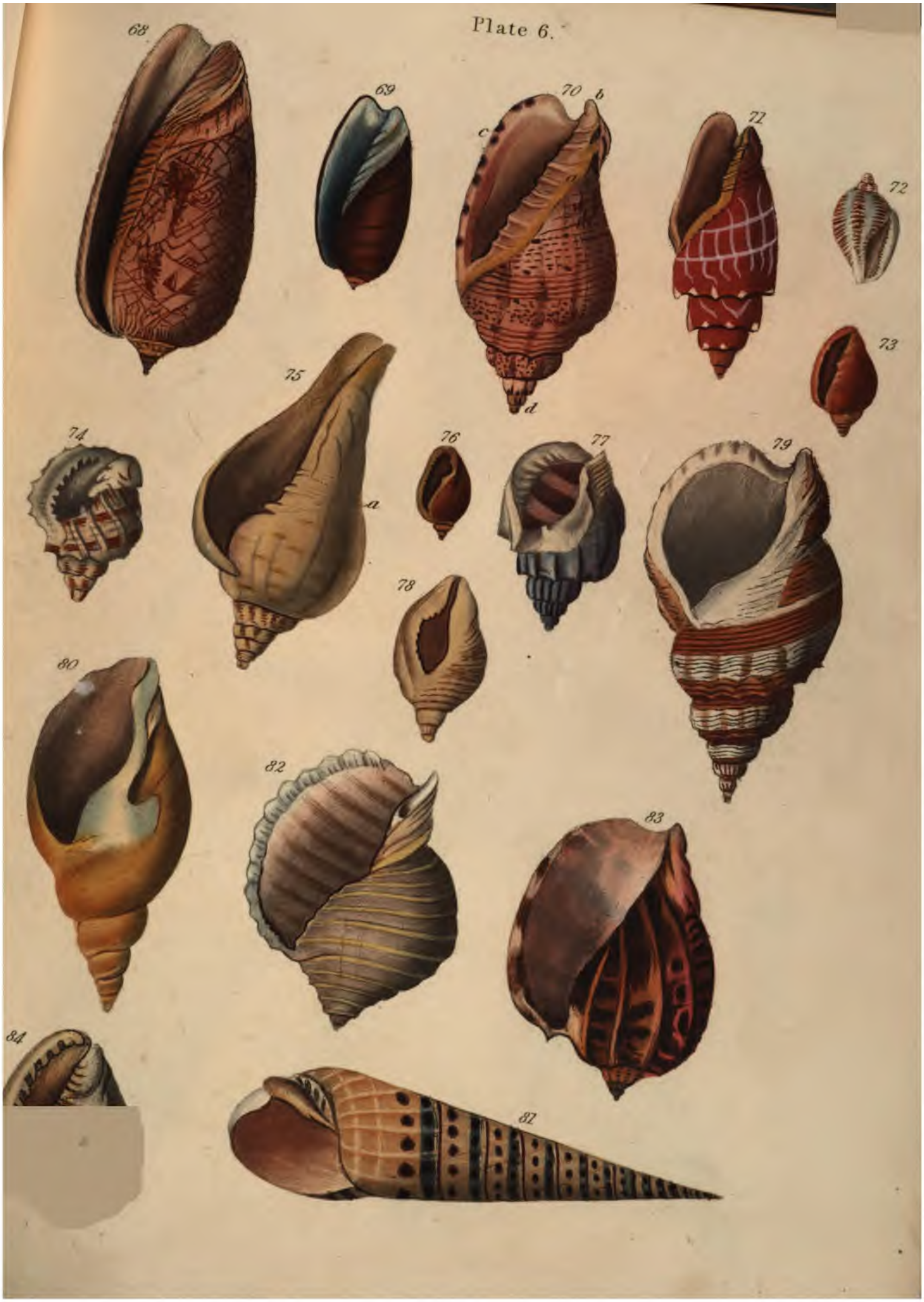

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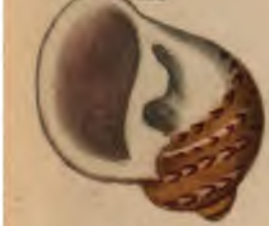
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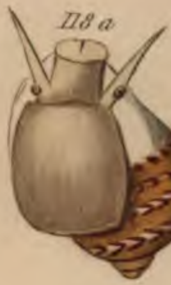
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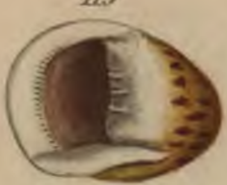
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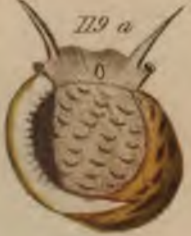
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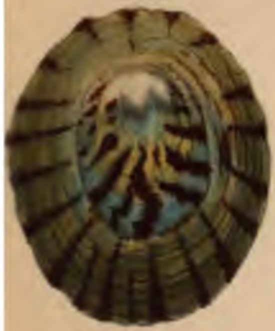
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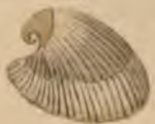
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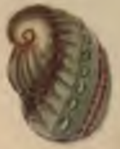
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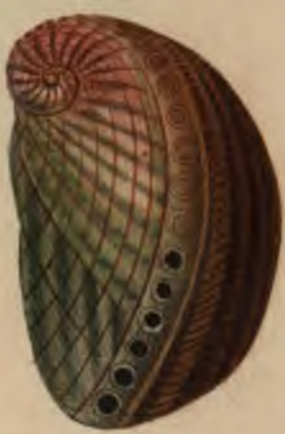
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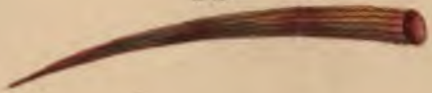
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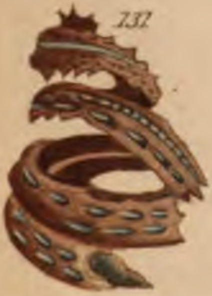
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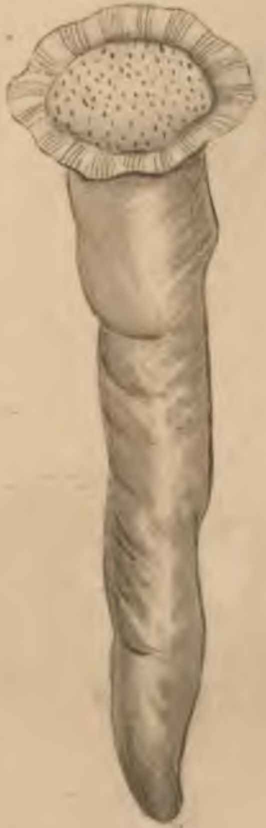
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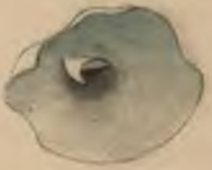
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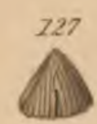
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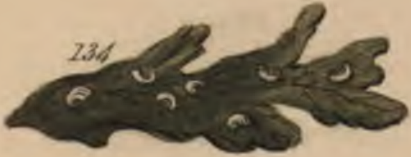
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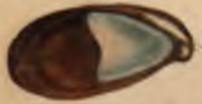
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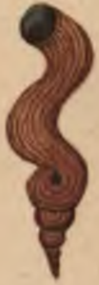
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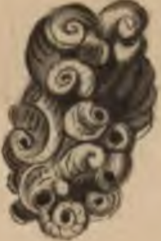
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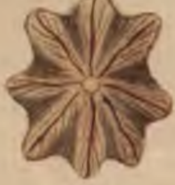
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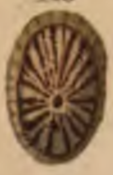
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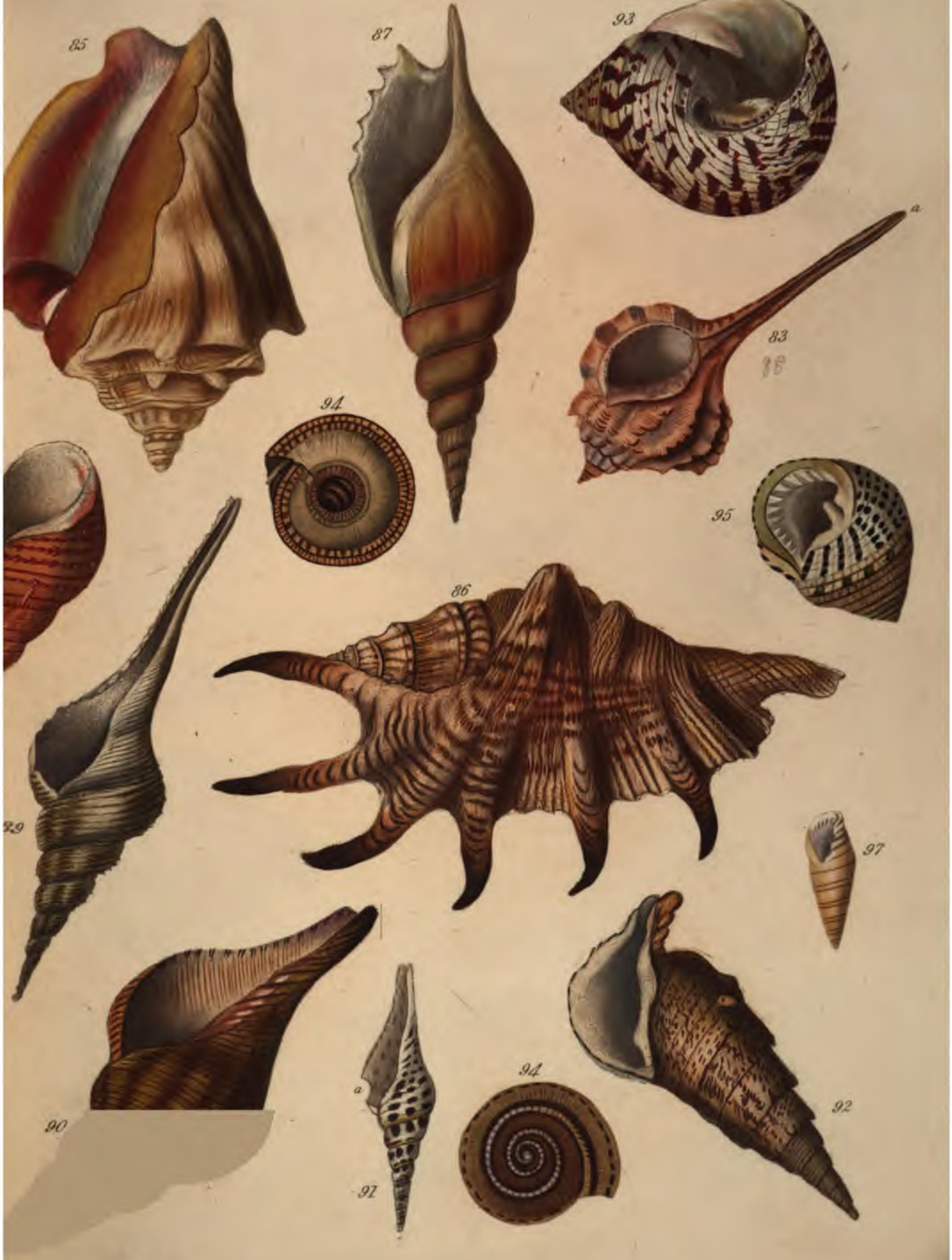

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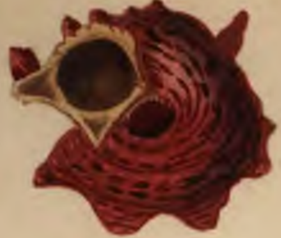

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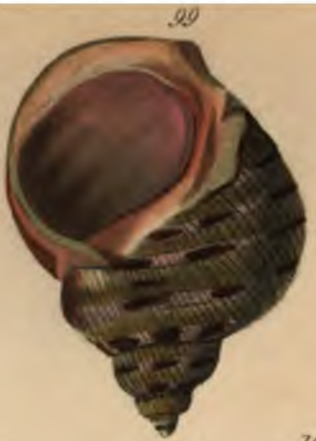

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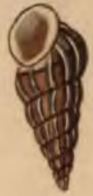

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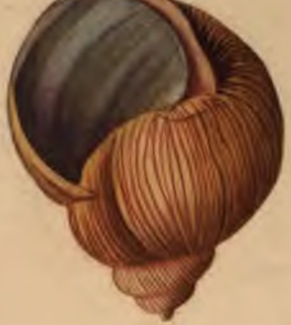

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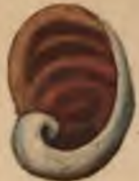

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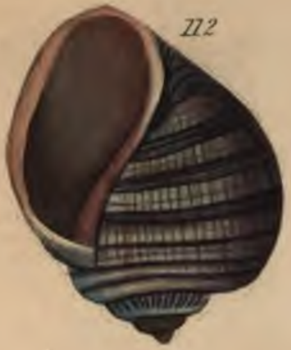

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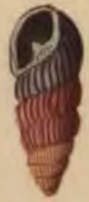

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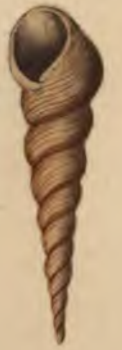

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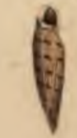

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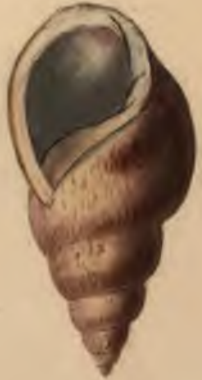

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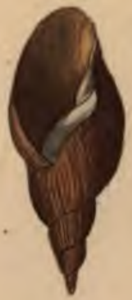

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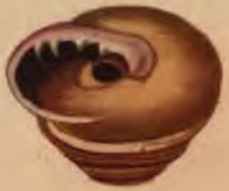

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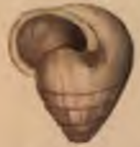

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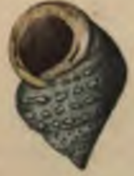

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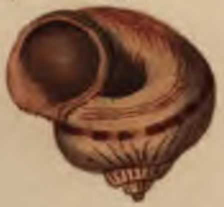

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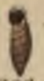

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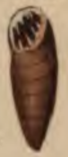

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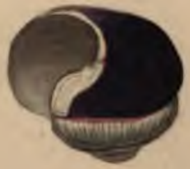

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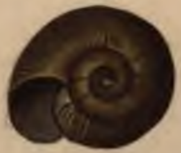

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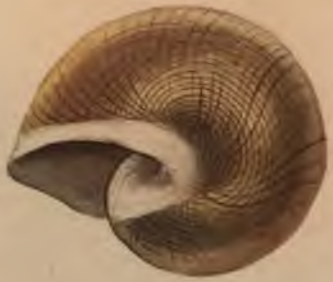

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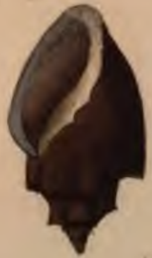

Plate 9.

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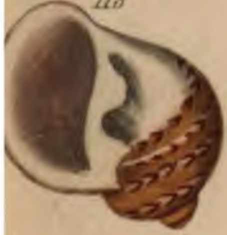

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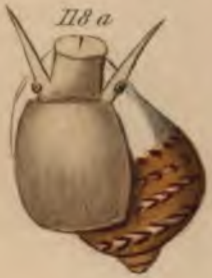

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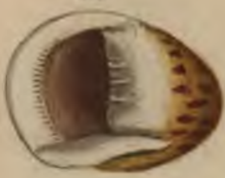

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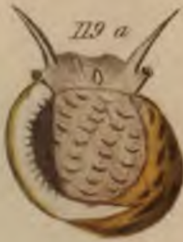

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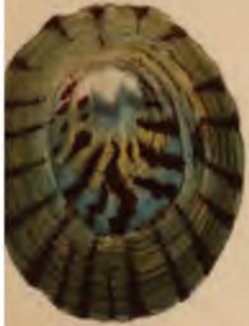

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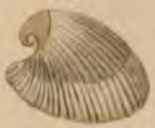

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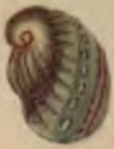

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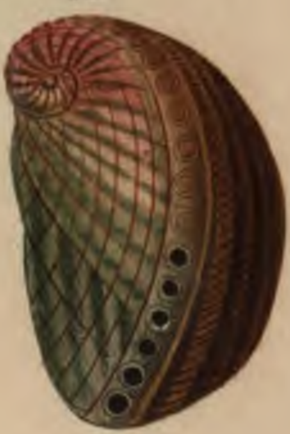

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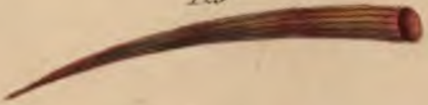

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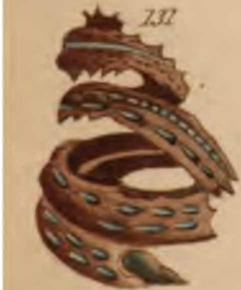

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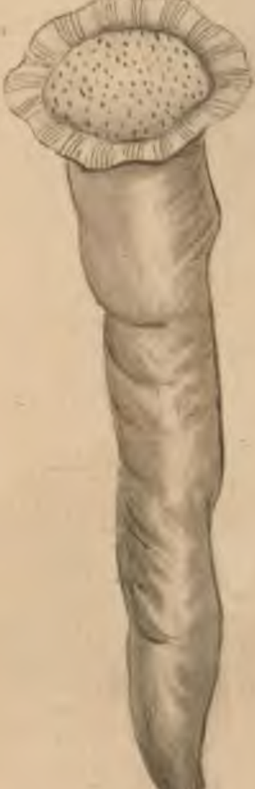

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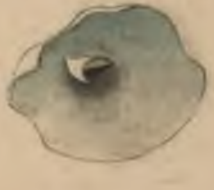

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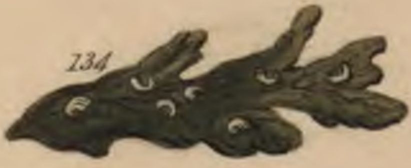

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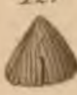

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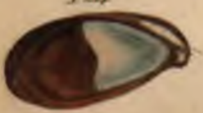

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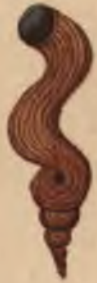

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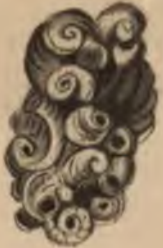

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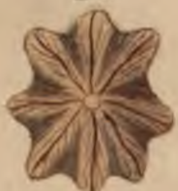

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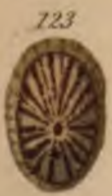

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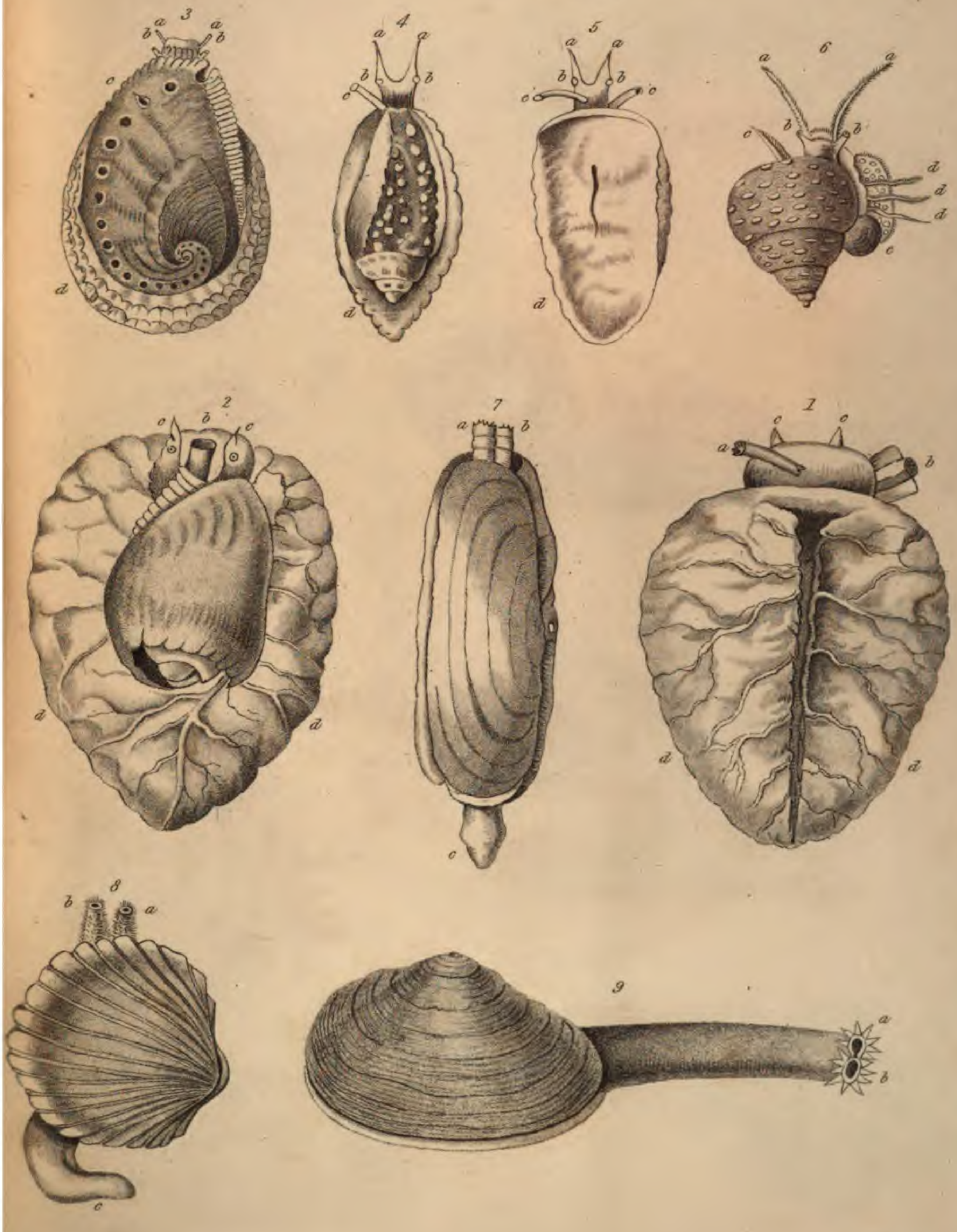

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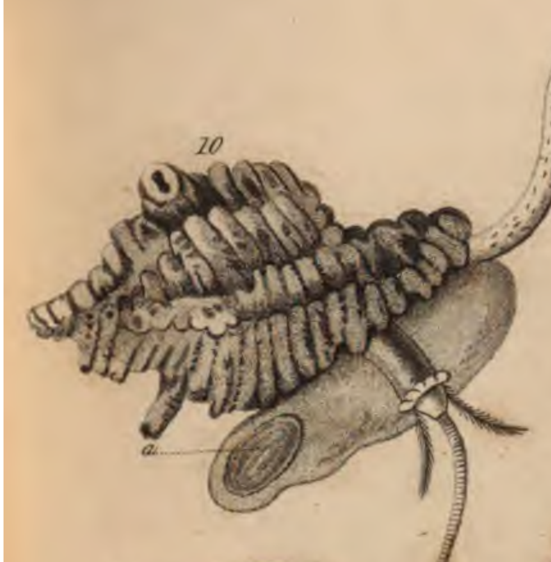
ODLEIA

Plate II.

10



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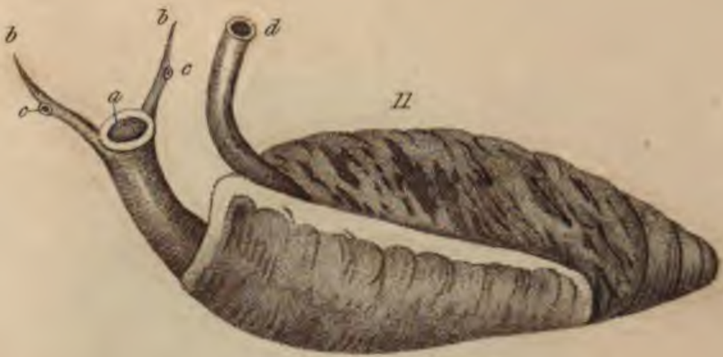

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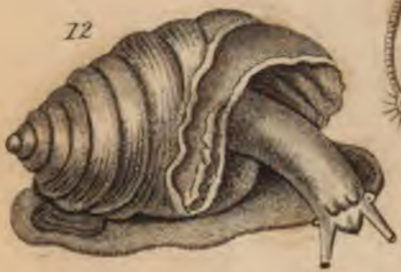

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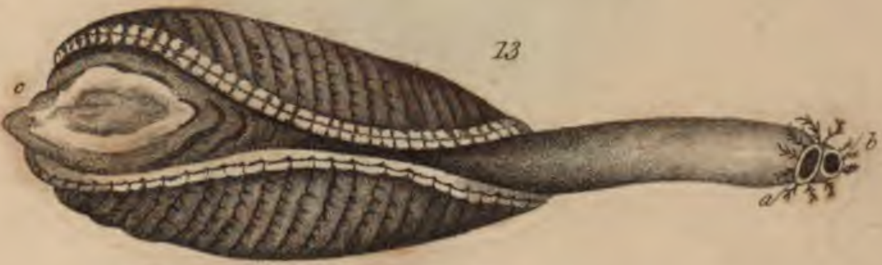

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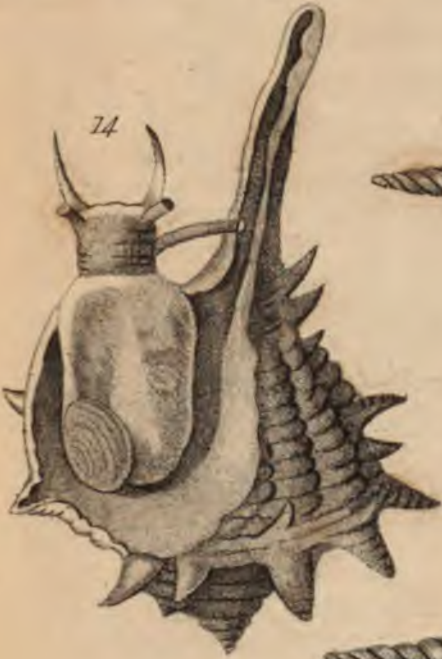

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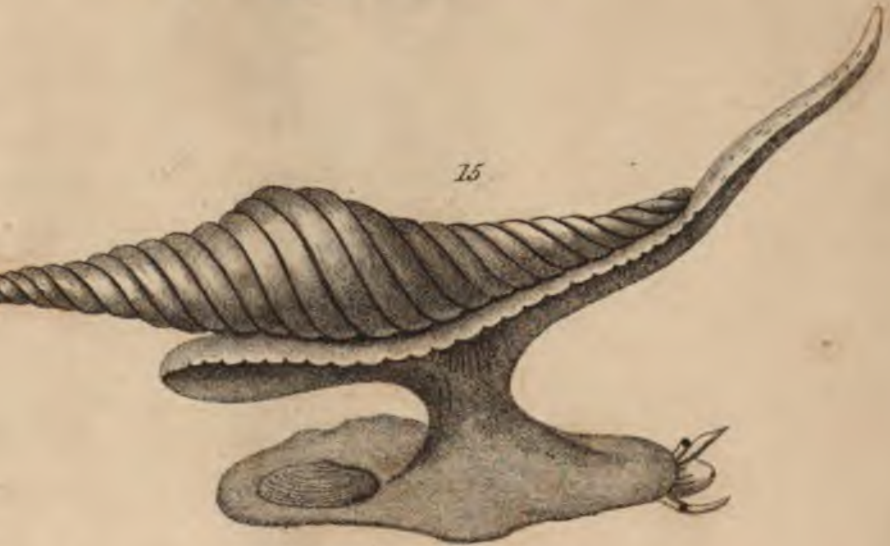

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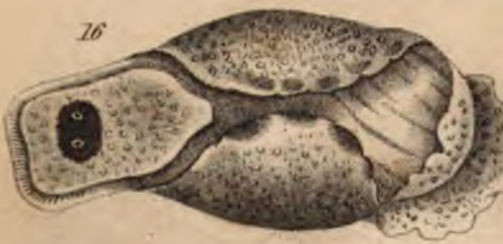

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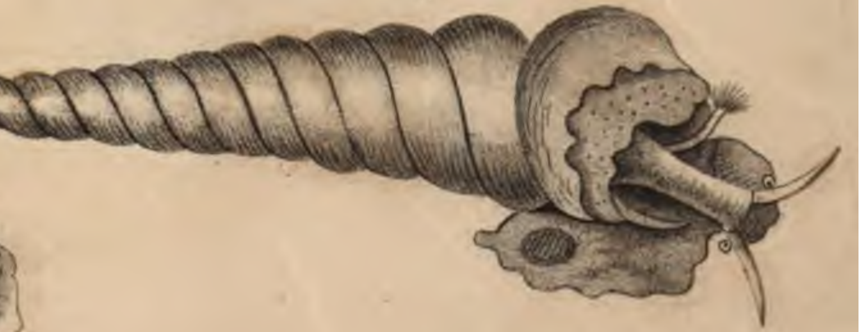

ODLEIAN

EXPLANATION OF THE PLATES.

Plate 1.

Fig.

1. *Chiton squamosus.*
   - *c.* the scaly border.
2. *Lepas anatifera.*
   - *a.* the tentacula of the animal.
   - *b.* the cartilaginous tube.
3. The four valves of the operculum of *Lepas Tintinnabulum.*
4. *Lepas tracheæformis.*
5. ——— *Tintinnabulum.*
   - *a.a.* the outer valves.
   - *b.b.* the inner valves.
   - *c.* the operculum.
6. The under side of *Lepas Diadema.*
7. A single valve of *Pholas Dactylus.*
   - *A.* the cells at the back of the hinge.
8. The four accessory valves of *Pholas Dactylus.*
9. *Pholas Dactylus*, with the accessory valves in their places.
10. One valve of *Mya truncata.*
    - *a.* the hollow of the tooth where the cartilage is fixed.
    - *b.* the truncated end.
11. The two valves of *Mya Vulsella.*

Plate 2.

12. *Mya pictorum.*
    - *a.* the hinge and teeth.
13. *Solen Vagina.*
    - *a.* the cartilage.
14. *Solen sanguinolentus.*
15. *Tellina cornea.*
    - *a.* the hinge and teeth.

Fig.

16. *Tellina divaricata.*
17. ——— *radiata.*
18. The two valves of *Tellina inæquivalvis.*
19. *Cardium Unedo.*
20. *Mactra lutraria.*
    - *a.* the hollow where the cartilage is fixed.
    - *b.* the diverging tooth.
21. *Mactra stultorum.*
22. *Donax Irus.*
23. ——— *cuneata.*
24. *Venus divaricata.*
25. ——— *verrucosa?*

Plate 3.

26. *Venus Meretrix.*
    - *a.* the base.
    - *b.* the upper margin.
    - *c.* the anterior margin.
    - *d.* the posterior margin.
27. *Venus imbricata?*
28. ——— *deflorata.*
29. *Spondylus Gaderopus.*
    - *a.* the *area* or triangular space between the hinge and the beak.
30. *Spondylus plicatus.*
31. *Chama Gigas.*
32. ——— *Hippopus.*
33. ——— *antiquata.*
34. One valve of *Chama Cor.*
35. *Chama Lazarus.*
36. The two valves of *Arca Nucleus.*

Fig.

37. The two valves of *Arca Pectunculus.*
    a.a. the beaks.

38. *Arca Noæ.*

PLATE 4.

39. One valve of *Ostrea Malleus.*
    a. the hollow where the cartilage is fixed.
    b. the hollow for the byssus.
    c. the muscular impression.

40. *Ostrea Ephippium.*

41. ——— *opercularis.*
    a. the connecting cartilage.
    b.b. the ears.

43. *Ostrea Lima.*

44. *Crenatula Mytiloides.*

45. *Anomia Gryphus.*

46. ——— *Placenta.*
    a. the two diverging ridges.
    b. the corresponding hollows.

47. The flat valves of *Anomia Ephippium.*
    a. the perforation.

48. *Mytilus Modiolus.*

49. ——— *anatinus.*

50. ——— *Hirundo.*

51. *Pinna muricata.*

PLATE 5.

53. *Argonauta Argo.*

54. *Nautilus Pompilius.*
    a. a part of the outer shell removed, to show the internal construction.

55. *Nautilus Spirula.*

56. ——— *obliquus* magnified.
    a. the natural size.

57. *Nautilus Fascia* magnified.
    a. the natural size.

58. *Nautilus Beccarii.*

59. *Conus marmoreus,* with the animal.

Fig.

59. *a.a.* the horns.
    b.b. the eyes.
    c. the windpipe or breathing-tube.
    d. the operculum.

60. *Conus Mercator.*
    a. the spire.
    b. the base.
    c. the outer lip.
    e. the apex.

61.*a.* *Cypræa Caput serpentis,* with the animal.
    b.b. the horns.
    c. the windpipe.
    d.d. the side membranes which cover the shell.

61.*b.* *Cypræa Caput serpentis.*

61.*c.* A young shell of the *Cypræa;* genus not perfectly formed.

62. *Bulla aperta.*

63. —— *Terebellum.*

64. —— *Ficus.*

65. —— *Ampulla.*

66. —— *virginea.*

67. —— *cylindrica.*

PLATE 6.

68. *Voluta porphyria.*

69. ——— *Oliva.*

70. ——— *musica.*
    a. the folds or teeth on the pillar lip.
    b. the hollow or notch at the base.
    c. the outer or right lip.
    d. the apex or point of the spire.

71. *Voluta papalis.*

72. ——— *mercatoria.*

73. ——— *glabella.*

74. ——— *cancellata?*

75. ——— *Pyrum.*
    a. the teeth on the pillar lip.

76. *Voluta Coffea.*

Fig.
77. *Buccinum Arcularia.*
78. ——— *Lapillus.*
79. ——— *undatum.*
80. ——— *glabratum.*
81. ——— *maculatum.*
82. ——— *Dolium.*
83. ——— *Harpa.*
84. ——— *cornutum jun.*

PLATE 7.

85. *Strombus pugilis.*
86. ——— *Lambis.*
87. ——— *Fusus.*
88. *Murex Haustellum.*
    a. the superior canal of Adanson, called the tail, *cauda*, by Linnæus.
89. *Murex Colus.*
90. ——— *Tulipa.*
91. *Murex babylonius.*
    a. the inferior canal of Adanson, the cleft *labro fisso* of Linnæus.
92. *Murex Aluco.*
93. *Trochus niloticus.*
94. ——— *perspectivus.*
    a. the upper side.
95. *Trochus Labio.*
96. ——— *Phasianella?*
97. ——— *dolabratus.*

PLATE 8.

98. *Turbo Delphinus.*
99. —— *Cochlus.*
100. —— *scalaris.*
101. —— *Uva.*
102. —— *Terebra.*
103. —— *bidens.*
104. —— *muricatus.*
105. *Helix Cornu arietis.*
106. *Turbo Juniperi* magnified.
    a. the natural size.

Fig.
107. *Helix janthina.*
108. —— *oblonga.*
109. —— *stagnalis.*
110. —— *Pomatia.*
111. —— *haliotoidea.*
112. —— *ampullacea.*
113. —— *sinuata.*
114. —— *Epistylium.*
115. —— *cornea.*
116. —— *Gualteriana.*
117. —— *Amarula.*

PLATE 9.

118. *Nerita Canrena.*
    a. Nerita Canrena, with the animal.
119. *Nerita polita.*
    a. Nerita polita, with the animal.
120. *Haliotis imperforata.*
121. ——— *tuberculata.*
122. The under side of *Patella equestris.*
123. *Patella græca.*
124. ——— *fornicata.*
125. ——— *ungarica.*
126. ——— *testudinaria.*
127. ——— *Fissura.*
128. ——— *saccharina.*
129. *Dentalium striatulum.*
130. *Serpula Penis.*
131. ——— *anguina.*
132. ——— *lumbricalis.*
133. ——— *glomerata.*
134. ——— *Spirorbis.*

PLATE 10.

1. The under side of the animal of *Voluta Olla.*
    a. the trunk, with the mouth at the extremity.

Fig.

1. *b.* the breathing-tube or windpipe.
   - *c. c.* the horns.
   - *d. d.* the foot.
2. *Voluta Olla*, with the animal.
   - *b.* the breathing-tube.
   - *c. c.* the horns, with the eyes at the base.
   - *d. d.* the foot.
3. *Haliotis tuberculata*, with the animal.
   - *a. a.* the horns.
   - *b. b.* the columns supporting the eyes.
   - *c.* part of the pallium, perhaps answering the purpose of a windpipe.
   - *d.* the foot, with two rows of fringes.
4. *Voluta glabella*, with the animal.
   - *a. a.* the horns.
   - *b. b.* the eyes.
   - *c.* the breathing-tube.
   - *d.* the foot.
5. The under side of the animal of *Voluta glabella*.
   - *a. a.* the horns.
   - *b. b.* the eyes.
   - *c.* the breathing-tube.
   - *d.* the foot.
   - *e.* the trunk and mouth.
6. *Trochus tessellatus*, with the animal.
   - *a. a.* the horns.
   - *b. b.* the columns supporting the eyes.

Fig.

6. *c.* a pointed bony horn, the use unknown.
   - *d. d. d.* three tentacula or arms similar to the horns *a. a.*; it has three on the other side opposite to these: the use unknown.
   - *e.* the operculum.
7. *Solen strigilatus* var.
   - *a. b.* the two tubes mentioned at p. 15.
   - *c.* the foot.
8. *Cardium ringens*.
   - *a. b.* the two separate tubes.
   - *c.* the foot.
9. *Mya Arenaria*.
   - *a. b.* the two conjoined tubes.

PLATE 11.

10. *Murex ramosus* var.
    - *a.* the operculum.
11. *Voluta Oliva*.
    - *a.* the mouth.
    - *b. b.* the horns.
    - *c. c.* the eyes.
    - *d.* the breathing-tube.
12. *Turbo littoreus*.
13. *Pholas Dactylus*.
    - *a. b.* the two conjoined tubes.
    - *c.* the foot.
14. *Murex Brandaris*.
15. *Murex babylonius*.
16. *Bulla Hydatis*.
17. *Turbo Terebra*.

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